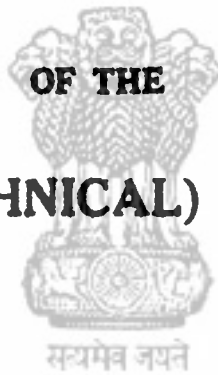




REPORT
OF THE
PORTS (TECHNICAL) COMMITTEE



NEW DELHI: PRINTED BY THE MANAGER
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WAR TRANSPORT DEPARTMENT

RESOLUTION

New Delhi, the 16th January 1946

No. 19-P(94)/44.—In pursuance of a recommendation made at the meeting of the Policy Committee on Transport held on the 30th October 1945 in New Delhi, and in agreement with the Governments of the maritime provinces, the Governor-General-in-Council is pleased to constitute a technical committee with the following terms of reference :—

(a) Whether a sheltered deep-sea port on the East coast of India for the accommodation of ships of large size and tonnage at all seasons of the year is required, whether construction is feasible and if so where ; also what measures are necessary for establishing it ;

(b) whether there is justification for the conversion of any minor ports on the coast of India to major ports, if so, whether such conversion is practicable ; also whether there are any other projects for construction of major ports which ought to be considered ;

(c) what steps are necessary to develop minor ports in order to meet probable demands of coastal shipping traffic.

2. The composition of the committee will be as follows :—

(1) Sir Godfrey Armstrong, O.B.E., War Transport Department, Government of India, Chairman.

(2) I. W. Balcombe, Esquire, Chairman, Calcutta Liners Conference.

(3) M. A. Master, Esquire, Scindia Steam Navigation Company, Bombay.

(4) D. P. Khaitan, Esquire, nominated by the Federation of Indian Chambers of Commerce and Industry.

(5) M. H. Gazdar, Esquire, nominated by the Federation of Muslim Chambers of Commerce and Industry.

(6) J. R. Galloway, Esquire, nominated by the Associated Chambers of Commerce.

(7) A. Webster, Esquire, C.I.E., Chief Engineer, Calcutta Port Commissioners.

3. The committee will have power to co-opt additional members for consultation and advice as it thinks fit.

4. The committee will be known as the Ports (Technical) Committee and is requested to submit its recommendations to Government within a period of four months from this date.

First Term of Reference

- 1 . Introduction.
- 2 . The first question referred.
- 3 . Size and tonnage of ships to be considered.
- 4 . Contrast with West Coast.
- 5 . Madras Port.
- 6 & 7 . Scheme of Improvement.
- 8 . View of the Future.
- 9 . Vizagapatam.
- 10 . Past History and General Design.
- 11 . The theory of the Paying Port.
- 12 . General reasons for developing the Port of Vizagapatam.
- 13 . Scheme of Improvement.
- 14 . Information offered by the Industrial Adviser.
- 15 . The Graving Dock.
- 16 . Conclusion.
- 17 . Possible Port between Calcutta and Vizagapatam.
- 18 . Calcutta.
- 19 . Proposed Ship Canal.
- 20 . Other Improvements.
- 21 . Conclusion.
- 22 . Cocanada.
- 23 . Conclusion of First Term of Reference.
- 24 . Strategic Aspect.

Second Term of Reference

- 25 . Major and Minor Ports.
- 26 & 27 . Place of State Port Projects in Indian Trade.
- 28 . The Problem of Customs Revenue.
- 29 . Self-sufficient Ports.
- 30 to 33 . The Kathiawar and Cutch Ports.
- 34 & 35 . Sika.
- 36 . Kandla.
- 37 . Veraval.
- 38 . Other Ports.
- 39 . Railways.
- 40 & 41 . Bhatkal.
- 42 . Past History of the Scheme.
- 43 . Railway Connection.
- 44 . Geographical Position.
- 45 . Traffic Prospects.
- 46 . Financial Implications.
- 47 to 51 . Vizhinjam.
- 52 & 53 . Rameswaram Canal.
- 54 & 55 . Value of the Canal as a Short-cut.
- 56 to 59 . Weakness of the Project.
- 60 . Cocanada.

Third Term of Reference

61	. Line of Approach.
62	. The Maritime Provinces and States.
63	. Government Policy in Shipping and Railways.
64	. Sand Movement.
65	. Does Trade follow the Facility ?
66	. Ports of the Bombay Province.
67	. General Proposals for Improvement.
68	. Passengers.
69	. Minor Port Policy.
70	. Conservation of the Coastline.
71	. Madras Minor Ports.
72	. Madras Government Plans.
73	. Natural Handicap of the Eastern Ports.
74	. Proposed Dredgers.
75	. Overseas Trade of Minor Ports.
76	. Works Proposed.
77	. Less Urgent Works.
78	. Financing of the Works.
79	. Calicut and Tuticorin.
80	. Other Port Projects.
81	. Conclusion of Report.
82	. Recommendations.

Introduction

1. Before we proceed with our task we deem it our duty to make one or two general observations. Our terms of reference do not ask us to consider the needs of the whole of India and to recommend the adoption of a port policy which may be most beneficial in the interests of the country. But the economic indivisibility of British India and Indian States, the increasing requirements of their rapidly expanding agriculture and industries, the desirability of the dispersal of industries, the integration and implementation of a comprehensive, well-balanced and efficient policy of transport, and its effective development in all its forms, the routing of trade through ports without being influenced by Customs Policy, the need for a long view in the siting of new ports and the development of existing ones, the evolution of a sound policy of defence for the whole country, the geographical position and importance of India in the Indian Ocean and the strategic importance of India in the development of a world order in the Far East, all these are considerations of vital importance in the establishment and development of suitable ports round the coasts of India and the formulation of an all-embracing and progressive port policy for this country. Our approach to the question which we have been asked to deal with has, we must confess, not escaped altogether the influence of these broad considerations.

The first question referred

2. The first term of reference to the Committee is as follows :—

“Whether a sheltered deep-sea port on the East Coast of India for accommodation of ships of large size and tonnage at all seasons of the year is required ; whether construction is feasible and if so where ; also what measures are necessary for establishing it.”

This term of reference was evidently based on para. 15(a) of the report of the Inter-departmental Port Development Committee in 1945 which reads as under :—

“More deep-sea ports may be needed on the coast of India to meet anticipated expansion of trade, and in particular one of easy access to large ships on the East Coast, but the figures of expected trade do not by themselves justify more ports.”

Size and tonnage of ships to be considered

3. The Committee has first of all had to make up its mind what is the largest size and tonnage of ship that has to be considered, and has come to the conclusion that the deepest draft that need be provided for is 30 feet and the greatest length 600 feet. These dimensions exclude from consideration the larger passenger ships of the P. & O., Orient and Union Castle Lines ; in the view of the Committee such ships and even larger ones required for naval and military purposes such as aircraft carriers or transports cannot entirely be left out of account as will be seen later. But for ordinary everyday commercial purposes the ship of 30 feet draft and 600 feet length may be taken as the largest client of the eastern ports that ought to be catered for without serious restrictions, and for the entrance of larger ships certain limitations, as noted below against each port, may be regarded as reasonable. The fact that there is no port on the East Coast of India able to take ships of the Queen Mary class as do the ports of Southampton, Sidney and New York is a geographical fact and must be accepted as such and the further fact that there are certain specific limits to the entrance of ships of—let us say the Strath class—need not unduly disturb us. Our standard is the ship of 30 feet draft and 600 feet length and we would like to see at least one port on the East Coast capable of dealing with ships of this size throughout the year without any restrictions. At the same time we must bear the larger ships in mind.

Contrast with West Coast

4. The West Coast of India is equipped with three large deep-sea ports or four, if we count Mormugao, the Portuguese port lying between Bombay and Cochin. All of these ports can accommodate without difficulty ships of 30 feet draft and 600 feet in length. Bombay and Karachi can take even very much larger ships, but, whereas the West Coast of India is thus laid well open to the world's shipping, the ports on the East Coast are limited and difficult and it is this handicap of the Eastern ports that was felt so seriously during the war and that has led to the reference made by Government to this Committee.

Madras Port

5. With the above standard of shipping before it the first port visited by the Committee was Madras. This harbour can accommodate large ships of the Strath and aircraft-carrier size, but cannot safely hold such ships in a cyclonic storm. Such storms are experienced from time to time in the period 15 October to 15 January and have to be taken account of. The shallow coastal shelf at Madras is narrow, ocean depths are comparatively close inshore and the seas that enter the harbour consist of deep transitory waves. During a cyclonic storm these set up a range in the harbour which on occasions breaks the ropes of ships and prevents them working at one or more quays, though not usually at moorings.

The Chairman of the Port Trust has in view a scheme for dealing with this range by means of a barrage or screen of bubbles of compressed air, what he calls "air break-waters". The compressed air will be projected upwards through holes in a pipe lying across the floor of the harbour entrance and will, it is hoped, break the oceanic swell entering the harbour. We are told by the Chairman that he has made experiments on the above lines on a small scale with some success, but he considers it necessary that more experiments should be made. If these experiments prove quite successful in breaking the oceanic swell entering the harbour, as the Chairman of the Trust expects, even ships of 30 feet draft and almost any length (a 725 feet ship has lain alongside a quay inside the enclosed harbour) can use the port throughout the year and the term of reference is fully met so far as its direct question is concerned, the cost of the "air break-waters" having to be reckoned not in lakhs or crores of rupees, but in thousands only. This is an extremely interesting idea and may, it is hoped, prove a practicable one.

Scheme of Improvement

6. Madras was not very seriously affected during the war by the cyclone trouble and in this it was fortunate, but it was found to be far too small, its water area was not enough for the ships it was required to hold and its waterfront was seriously inadequate. The Port Trust Board has therefore under consideration a long-term scheme for increasing its ship quay capacity by excavating a wet-dock in the first place to accommodate four large ships and later, as trade may require, ten ships. It would protect the entrance to this dock with some form of "spending beach" and a sheltering arm so as to reduce the swell and enable ships to lie almost motionless within the dock.

7. The following extracts from a note written by the Chairman of the Port Trust fully explain the scheme :—

- " (a) The threat of sand drift closing the Harbour Entrance is no longer a formidable problem for the Board has taken steps to control the movement of sand by providing a dredging unit which will operate from the sand screen, and, it is hoped, will thus intercept the travel of drift well south of the entrance. Madras is a deep water sea port and can be kept as such ; it has a large estate made up of the south

accretion, and land earmarked for the construction of the Dock can be replaced by extending the Harbour premises further south (up to the River Cooum if necessary) provided other authorities interested in the land to be taken over show a sympathetic interest in the development of the Port and its facilities.

There is no insuperable engineering difficulty to overcome in providing a wet dock at Madras capable of taking two or more 600 feet vessels drawing 30 feet but there is a preliminary problem to solve first before a dock can be constructed which will allow ships to lie alongside throughout cyclonic storms which affect the Port by setting up deep wave action or range inside the Harbour.

* * * *

- (b) 'Range' is the chief disability from which this port suffers. By 'range' I do not mean waves which are raised by wind action inside the Harbour and which may be three to four feet high but do not extend deep enough to move a laden ship; I refer to those waves which are generated at sea and are propagated into the Harbour during a storm; they only occur in a serious form when cyclonic storms are generated in the southern section of the Bay of Bengal and particularly when these storms travel north of the port; on these occasions, two or more berths become untenable depending upon the severity of the storm and the turnround of shipping suffers in consequence. The reason why this problem has never been solved is because, during the years of peace, a delay of a few days to shipping although undesirable was not a matter of serious consequence and also because the reduction of range in a harbour to safe and convenient limits is not an exact science; it involves the construction of 'spending beaches' or wave traps which destroy the energy of transitory waves and which have to be carefully sited after experiments on models are carried out. Some years ago range readings were recorded at this port and the highest observations which did not take into account 'wind loup' were as follows :—

(i) Across the entrance	.	.	.	.	.	.	2' 9"
(ii) At South Groyne	.	.	.	.	.	.	3' 6"
(iii) At North Groyne	.	.	.	.	.	.	2' 9"

Waves such as these are sufficient to render every berth in the Harbour untenable for they extend to the bottom of the Harbour. Usually at seaports exposed to wave action, the highest readings occur at the entrance and gradually become less owing (1) to the expansion or lengthening of the waves once they pass the entrance and (2) to the reaction of the still water inside the harbour. At Madras however, it will be observed that the highest readings occur at the South Groyne, the harbour entrance being in the North Groyne. The reason for this is that the harbour is bounded by four vertical walls, which is consistent with the necessity for providing quay accommodation but which helps to 'build up' instead of decrease wave action. The south quay berths are, therefore, the first to go out of action (even before the East Quay which is nearer the entrance) and, if the storm is severe, the West Quays and North Quay follow owing to reflected wave action from the South Groyne.

- (c) Range at this port could be reduced if short intercepting jetties were constructed along the inside of the eastern break-water to form wave traps and if the entire South Groyne, instead of taking the form of a vertical wall, were given a slope of say 1 in 4 to form what is known as a 'spending beach'. An extremely interesting example of a small 'spending beach' is the L.S.T. Hard near the west

end of the South Quay ; during the recent North-East monsoon when a storm passing north but well eastward of the port rendered most berths untenable to shipping, two L.S.Ts lay very comfortably at the Hard owing to the waves dissipating themselves up the Hard ; the tip of the Hard was not sufficiently deep nor was the Hard itself long enough to affect the ranging at the West Quay but it did reduce the height of waves immediately east and west of the Hard.

- (d) Apart from the proposal to construct a wet dock, I have been interested in the reduction of range for some years but the war put a stop to experimental work I had in mind. Towards the latter half of November, 1945, however, when certain berths were untenable, the following experiment was carried out at the entrance to the Boat Basin which is 79 feet wide. A 2" pipe punctured with 1/4" holes at a pitch of 12" was laid across the bed of the entrance ; both ends were blank flanged and through a 4" pipe connected to the centre of the 2" pipe, compressed air was pumped by a compressor. The air bubbles rose to the surface in the form of a curtain or screen and tended to destroy the energy of the waves in the line of the screen of bubbles ; the air was switched off and on several times and each time it was turned on, there was a perceptible difference in the ranging on the Boat Basin side of the pipeline. The idea was not mine. It was tried out in America some thirty years ago with, it was claimed, some success but to the best of my knowledge it has never been adopted in any of the Home or Empire Ports. There are difficulties to overcome such as keeping sand out of the line, barnacles from growing over and closing the holes but further experiments will be carried out next November to try and arrive at a correct appreciation of its worth.

I believe that, if wave traps are introduced on either side of the entrance to the proposed dock, it will be possible to provide a 100 feet entrance which could be fitted with gates, operable in all weather.

If the experiments with what I call an " air breakwater " are successful and are combined with wave traps, range can be reduced to safe limits ; in this case I would advocate increasing the entrance to 150 feet in the interests of manoeuvrability of ships in and out of the dock and in order to avoid dock gates altogether which are very expensive to maintain.

I have laboured the subject of range intentionally for Sir Godfrey Armstrong has emphasised in his note that, if a dock is to be provided, it must be an all weather one, and to meet this demand it is essential to solve the problem of range at this port.

* * * * *

- (e) The best way of providing additional accommodation on a large scale is obviously to construct a wet dock on the south side of the harbour and to provide that dock with up-to-date facilities such as ample quay cranes, modern double storied transit sheds which will accelerate the rate cargo can be delivered and received and adequate stacking areas served by land tugs and trailers.

* * * * *

- (f) *Entrance Works.*—The first requisite must be to reduce range at the entrance to the new dock. To do this a guide pier 20' wide and 600 feet long fitted with a wave trap is suggested on the east side of the entrance and a " spending beach " on the west side. The west side of the pier will be used for warping vessels into the dock after they have reversed in the outer Harbour. The entrance has been given as 150 feet in width which presupposes that some degree of success will be attained with the experiments to be carried out with an ' air breakwater '.

If the experiments are not successful, a sufficient reduction in range should be obtained by the wave traps on either side of the entrance to permit of dock gates being operated ; in this case, the entrance will be reduced to 100 feet.

* * * * *

Estimated capacity of Port after extension.—The present maximum capacity of Madras Port has been estimated at something like 1,750,000 tons of dry cargo per annum. By constructing a wet dock capable of accommodating 10 vessels and with transit sheds designed on the lines very broadly outlined in this note, the capacity of the Port could be increased to between five and six million dry tons a year ”.

* * * * *

View of the Future

8. Madras is advantageously placed geographically, as the port is at the capital of a province and has particularly good rail and road connections radiating in all landward directions. The cost of such a dock is very great being estimated at 5½ crores for the whole scheme, which is divided into two stages. There are no indications that the trade is going to require full construction at an early stage. On the other hand, the future of the country visualises the rapid expansion of industries and agriculture, and the possibility of such an expansion and growth in the trade of the country as may double the needs of the port must not, therefore, be ruled out.

The margin now in hand for expansion of trade, based upon the difference between the estimated present port capacity and the highest previous annual tonnage of dry cargo handled, is only about 350,000 tons, and, if any considerable expansion of trade takes place in the south as a result of the large schemes of the provincial government for hydro-electric development and irrigation, and following the government policy of countrywide dispersal of industry, a need for more ship quays at Madras may well be felt in the course of the next ten years. The Madras Port extension scheme is divided into two stages and meantime we need consider only the first stage, which provides a dock with four additional quay-berths at an estimated cost of about 3½ crores. Heavy construction work, such as is involved by this project, will probably take five years to complete, and, as it is advisable to carry out such work before the demand arises and the port capacity is strained, the Committee recommends that early consideration be given to Stage I of the Madras Harbour Extension Scheme which would increase the capacity of the port to a figure of about 2½ million tons of dry cargo per year.

Vizagapatam

9. The Committee next visited Vizagapatam and inspected the port. Here the particular physical feature that limits the size of ships is the entrance channel which cannot be relied on always to take ships exceeding 28 feet in depth and cannot always safely pass a ship exceeding 570 feet in length. The Committee, therefore, put to the General Manager of the Bengal Nagpur Railway, which now operates the port, the question whether the entrance could be improved to take ships of 30 feet draft and 650 feet in length at all times and received the reply that this could be achieved at a cost of Rs. 13 lakhs and further that, if the future could be content with ships of 30 feet draft and 600 feet length, it could secure this at a probable cost of only six lakhs of rupees. This latter figure is a very small expenditure when it is considered that it enables the port to take at all seasons of the year ships of the largest size that the Committee thinks will normally visit there. At the same time it does not provide for the larger type of aircraft carrier or transport that naval or military requirements might sometimes demand, and the Committee, therefore, hesitates to say that it is completely satisfied on this point in view of the considerations dealt with in paragraph 24 below. Moreover it was also pointed out to us that it was safer from the practical point of view to carry out the scheme in full at one and the same time and incur the whole expenditure. We would, therefore, strongly recommend that the expenditure of Rs. 13,00,000 be faced and the entrance be made suitable for ships of 30' draft and 650' in length.

Past History and General Design

10. It is desirable, before going further, to give a very brief account of the history of this port and its intended place among the Indian harbours. Inside the short entrance channel formed between the high bluff of the Dolphin's Nose on the south and the city of Vizagapatam with its small hills on the north lies an extensive basin, eminently fitted for a large harbour. Some twenty years ago the port was converted from a small and comparatively unimportant calling place for ships into a major port by dredging and reclamation works and construction of a few quays and other port works and was left to attract trade to make itself a successful commercial enterprise. Later the Raipur-Vizianagaram Line was opened to connect the new venture with the Central Provinces which is the area to be served by it. But during the last twelve years since its completion trade to the extent anticipated has not materialised, dredging has been a heavier expense than was hoped would be the case and in fact the port has not been a financial success. We were told that the Railway rate policy has also been responsible for preventing the cargo from the hinterland moving to the port. Although we have not been able to examine the extent of the justification of this allegation, we have no doubt that a well-thought-out Railway rate policy would have drawn a larger volume of traffic to this port and would have thus strengthened its ability to balance its budgets in the past.

The war has not helped very much since, though additional facilities have been provided, the steady trade development has been interrupted and military traffic has not been sufficiently heavy to form an adequate substitute for it. This year Government have decided to hand over the port for operation and administration by the Bengal Nagpur Railway and it has become to all intents and purposes a Railway Port.

The Theory of the Paying Port

11. At first sight it would appear unsound in principle to construct a new port which, while it cannot be itself a paying proposition, might have the effect of diverting trade from other ports thus forcing those ports to raise their dues to make up for reduction in tonnage.

It is, however, difficult to say when a port is a paying proposition. So far as the major ports in British India are concerned, they balance their budgets by raising the dues on vessels and charges on goods. We have no data to guide us as to the relevant burdens which ports in British India and Indian States impose on shipping and on trade. Without taking these relevant facts into consideration it would be difficult to examine and enunciate the theory of a paying port. It has been contended that the ports in Indian States have been able to put comparatively light burdens on shipping and trade, because these ports are financed from the general revenues of the State. The policy of arriving at a balanced budget by taking the receipts from the ports and railways together as against the aggregate expenditure on the ports and railways has been called into question. It should not, however, be forgotten that large ports in British India have been able to balance their budgets after bringing into the common pool their large incomes from such sources as land, buildings and railways. Without the inclusion of incomes from such sources in the general revenues of the port some of the ports would show a considerable deficit. It is very difficult to say that such ports, under such circumstances, are really paying ports. These aspects of the revenue of a port should merit the weight they deserve in enunciating the policy of a paying port. As the position stands today there is no data before the Committee to determine in the light of the above observations whether the major ports in British India and the ports in the Indian States are really paying propositions.

Apart from the difficulty of deciding whether a particular port is a paying port or not, the effect of diverting trade from one port to another will inevitably compel the port from which cargo is diverted to raise its charges all round and consequently be a deterrent to the development of trade at that port.

But there are cases in which a port of this description can be recommended :—

firstly when a long-term policy demands the opening of a new harbour which is required for development of an area and cannot possibly pay till that area is developed and secondly for strategic reasons in the interests of the country's defence and world-position.

General reasons for developing the Port of Vizagapatam

12. The Committee is of opinion that, on the grounds of defence and strategic requirements of the country and the industrial, agricultural and economic development which is sure to take place in the near future and also in view of the need for wider dispersal of port capacity throughout the country, a deep sea port where ships could safely enter at all times of the year and in all weathers is a great necessity. In the broad national interest of the country and to facilitate rapid expansion it is essential that railway developments should take place connected with such a port so that the hinterland lying behind it can be fully developed. The port should essentially be connected in all directions by a number of railways. It is the opinion of the Committee that the establishment or development of the port should precede the development of the hinterland for which there may be reasonable possibilities so that it may be available for traffic as it grows and demands an outlet. The port should give facilities for the entrance of ships of such length and such draft as may be visualised in the near future, and the Committee has expressed its opinion on the subject in para. 3 above.

It is also desirable that the port should be centrally situated on the East coast and, in view of all the factors mentioned above, the Committee feels that Vizagapatam would be a suitable port for such development, the more so because the Railway Board have already planned out an extensive railway net work in the hinterland.

In view of the above paragraph, the Government of India should give financial and technical assistance, particularly in the early stages, in order that the necessary development in the Port may be carried out and the port charges may not be kept at a high level.

The Committee is fully conscious of the fact that the development of this port may have the effect of diverting cargo from the existing major ports. It may be that a greater burden will fall on the trade passing through the ports from which cargo has been diverted. The Committee would, however, contend that in view of the economic development that is being planned both by the Central and Provincial Governments, this burden may be only temporary because the increased volume of the import and the export trade resulting from the country's development will become a great balancing factor in this matter. Further, even if there should be some diversion of trade or some reduction in the volume of the traffic at the existing ports with consequential increased charges which the trade will have to bear, the Committee is of the considered opinion that in the large national interest of India, Vizagapatam should be developed.

Scheme of Improvement

13. At Vizagapatam in the war period the limitation was, not the entrance channel, but the lack of quays and waterspace in the harbour. There were only three regular cargo quays in operation and the Army would have liked many more. Vizagapatam is, however, potentially a very large port ; it only suffers from youth. There is no physical difficulty to be met in enlarging the port so as to take 20 ships or more when traffic demands them. While geographically the port is well placed, the country behind it is poorly developed. Much money has, however, been spent on Vizagapatam and if an adequate return is ever to be obtained more must follow. That is an argument for increasing facilities in advance of trade, and taking this view the General Manager recommends works being undertaken in the following order :—

One new quay	2½ lakhs short term work.
Oil and coal quays	16 lakhs long term scheme.
Graving dock	60 lakhs long term scheme.
Improvement of entrance	13 lakhs long term scheme.

Information offered by the Industrial Adviser to the Government of India

14. The following works are planned in the area that may be expected to use Vizagapatam as its principal port :—

- (a) A steel works is projected at Raipur and is likely to be opened up within the next five years ; capacity 400,000 tons a year or nearly half that of Tatas.
- (b) Possibly steel works in the Godavari basin at a place called Ramapadasagar to be supplied with ore from iron deposits in Bastar State. This project is being pressed by the Hyderabad State but is, for the present at least, highly problematical.
- (c) *Machkund (Duduma) Hydro-Electric Scheme.*—This is on the Madras Orissa border and the scheme will be worked jointly between the Provincial Governments. It is scheme No. 116 in the Madras Post-War Development book and is expected ultimately to provide 103,500 KW of electric energy. The first stage which will provide roughly one-third of the ultimate capacity is estimated to take five years and the whole scheme could be completed in about ten years. But as it is considered unlikely that the ultimate capacity will be fully required for about twenty years, the scheme may not be finally completed for fifteen to twenty years. It is understood that power will be taken up by the two Provinces in the proportions of 70 per cent by Madras and 30 per cent by Orissa. So far as Madras is concerned, the scheme is expected to serve the Vizagapatam, Godavari, Kistna and Guntur Districts. The same scheme appears as Scheme No. 43 in the Government of Orissa Post-War Reconstruction and Development book under the name of the Hydro-Electric Scheme at Duduma.

The scheme will furnish cheap electricity to parts of Orissa and facilitate the establishment of industries such as the manufacture of aluminium, paper, cement, dry ice, etc.

The Industrial Adviser emphasised that, if Vizagapatam is to be the port for all or any of above schemes, it should be ready to cope with the imports of machinery, etc., required by the time the schemes are begun.

The Graving Dock

15. (a) A most important activity at the port to-day is the shipbuilding yard of the Scindia Company. This undertaking is not yet in full operation but the Committee members who visited it are greatly impressed with its size, its lay-out, its potentialities and its general air of efficiency. This is not the place to describe it in detail but the Committee is interested in it from the view-point of another proposed facility of the port, a graving dock which is expected to cost about Rs. 60 lakhs. This is a proposal of importance and the Committee gave it careful consideration.

(b) The points for and against it are set out below :—

Points against—

1. Cost of Rs. 60 lakhs.
2. Non-remunerative.
3. Foreign ships tend to dry-dock in their own countries.
4. Vizagapatam not at present nor in any future that can be certainly foreseen a terminal port, that is, ships do not usually end or begin their voyage there.
5. Until trade develops not a very large number of ships will call there.
6. So far as general shipping lines are concerned the graving dock can very well wait till trade develops. The dock should only take two years to build.

7. In the ordinary way ships will not normally dry-dock in the course of a voyage ; they will wait till the end.
8. Vizagapatam is already a deficit port ; it is contended that trade should pay for the dry-dock.

(c) *Points for—*

1. Vizagapatam must be given every encouragement to become a thoroughly well-equipped port or it cannot pay.
2. With the large volume of the exports of cotton, coal and steel which are visualised in the future, there is every possibility of the port becoming a terminal port.
3. The existence there of a good dry dock may bring ships to the port.
4. A dry dock is a very usual feature of an up-to-date port. Dry docks are not usually by themselves a paying proposition. It is not on the consideration of the return on the investment on the dry docks that dry dock facility is provided by ports. It is an essential need of shipping and every modern port considers it its vital responsibility to provide such a facility for shipping.
5. Accidents to ships happen in the Bay of Bengal demanding the services of a dry-dock.
6. Ship-building requires the proximity of a dry dock, and the nearer the better.
7. The shipyard at Vizagapatam is a strikingly fine undertaking and deserves every encouragement.
8. Though normally port undertakings are better supported on economic grounds the economist has not always the last word.
9. The Navy are likely to welcome the graving dock for their ships.
10. The placing of a dock at Vizagapatam is sound geographically.
11. The existence of a well-designed and equipped shipyard will ensure the presence of repair-facilities, technical staff and organisation required for a dry-dock.

(d) The Committee has tried to weigh fairly the points for and against the immediate construction of a dry-dock at Vizagapatam and their conclusion is in favour of it. At present Government have stopped half-way at this port. They have sunk large sums in the commercial port. The Scindia Co. has laid down a very fine ship-building yard which is the only one of its class in India and, as it is the country's policy to build up a substantial mercantile marine, every encouragement should be given to this industry. The possibilities of a naval base cannot be disregarded nor the strategical value of the harbour. To make it into a fine up-to-date harbour for ships, which it is potentially now, more expenditure must be faced and the future must be pledged.

Decision to build

(e) The General Manager of the Bengal Nagpur Railway, with whom the Committee had a discussion on the subject, favours the building of this Dock by Government as a normal port facility and also as an encouragement to the general trade of the port. He would like to see it taken in hand at the same time as other port improvements he has recommended and even before the widening of the entrance is proceeded with. Admittedly a graving dock is not in itself a remunerative facility ; even the dry-docks at Calcutta probably do not obtain a full return on the capital expended on them. But at Vizagapatam the dock may prove of the greatest help to the Navy, to the Ship-building-yard and to the port in general. It may be contended that there is little to be said for sinking more capital in a port already unable to pay interest on its present capital expenditure, but the point is that, unless the harbour develops, as geographically it can without difficulty, into a really first class

port, Government can never get any return on its capital, whereas the existence of a modern graving-dock must at least tend to encourage ships to visit Vizagapatam and so help to bring to fruition the original hopes on which the whole harbour scheme was started.

Conclusion

16. In conclusion the Committee strongly recommends that Vizagapatam on the East Coast should be developed as a sheltered deep sea port which can accommodate ships at least up to 650 feet in length and with drafts up to 30 feet.

For this purpose the Committee strongly recommends that the improvement at the entrance, the expansion of the quays, the building of a dry dock and the provision of other facilities mentioned in the Report, should be immediately taken in hand and the finance required for the execution of the whole project should be found by the Government of India.

The Committee suggests that with the further development of the Vizagapatam harbour and the railway system leading thereto, a proper future lay-out of the city of Vizagapatam with Waltair is called for.

Possible Port between Calcutta and Vizagapatam

17. The recommendation of the Committee for the development of Vizagapatam has not made it necessary for it to examine the possibility of the establishment of another sheltered deep sea port between Vizagapatam and Calcutta, but the Committee feels that the Government should investigate such a possibility in due course.

Calcutta

18. Calcutta is by far the largest port in India so far as the tonnage handled is concerned. That is because of its enormous coal traffic, its jute, pig iron and tea. In value of trade the comparisons are entirely different but we are not concerned with the question of which city handles the more valuable trade. A port is principally concerned with the weight and bulk of the commodities it has to handle and the Committee calculates the work of Calcutta Port on this basis.

Yet, Calcutta, owing to the difficulties of the Hooghly channels, can frequently only accept ships of 26 feet draft and can only on rare occasions receive ships of 30 ft. draft. The following statements show the outward drafts available during the year 1938 which may be taken as an average pre-war year and the outward and inward drafts for 1945 which was a bad year owing to shortage and deterioration of dredging plant and also a change in dredging policy to permit a large number of medium draft ships to arrive and depart from the port on any day throughout the year.

With an adequate fleet of serviceable dredgers and the maintenance of freshet discharge into the river headworks, it will be possible to restore the navigable channels to the 1938 standards, but it is doubtful if by these means alone it will be possible to provide for drafts of 24 feet on any day of year and 30 feet on any spring tide.

							<i>Outward</i>		No. of days below 26 ft.
1938							Maximum	Minimum	
January	.	.	.	.	.	.	20' 9"	24' 3"	9
February	.	.	.	.	.	.	28' 6"	24'	10
March	.	.	.	.	.	.	28' 3"	24'	8
April	.	.	.	.	.	.	28' 3"	24' 6"	8
May	.	.	.	.	.	.	29'	26'	Nil
June	.	.	.	.	.	.	29' 3"	26' 3"	"
July	.	.	.	.	.	.	30'	26'	"
August	.	.	.	.	.	.	30'	26'	"
September	.	.	.	.	.	.	29' 3"	22' 6"	12
October	.	.	.	.	.	.	29' 3"	24'	11
November	.	.	.	.	.	.	29' 6"	24' 6"	6
December	.	.	.	.	.	.	28' 6"	24' 3"	10

1945	Outward		Inward	
	Maximum	Minimum	Maximum	Minimum
January	25'	22' 6"	25'	22' 6"
February	26'	22'	25' 6"	22'
March	26' 6"	21' 3"	26' 3"	22' 6"
April	27'	22' 6"	27'	22' 6"
May	26' 6"	22' 6"	27' 6"	23'
June	26' 6"	23'	27'	23' 6"
July	27'	23'	27' 6"	24'
August	29'	24'	29'	24' 6"
September	28' 6"	23' 3"	29'	23' 6"
October	28' 6"	23' 6"	29'	24'
November	27' 6"	23'	28' 6"	23'
December	27'	22' 6"	27' 3"	23' 6"

This must be regarded as a serious handicap in a port of such importance and proved to be the most serious limiting factor during the war. The possibility of removing or at least very materially reducing it is now receiving the earnest attention of the Port Commissioners. A scheme is under consideration for building a ship canal from the Docks to Diamond Harbour 42 miles down the River. The canal projected is to be 25 miles long and to cut out 42 miles of river thus making a saving in distance of 17 miles to ships and incidentally the avoidance of the most dangerous section of the Hooghly River passage.

Proposed Ship Canal

19. The case for the canal is given in the following terms by the Chairman of the Port Commissioners :—

“ 1. A ship canal will give the following positive and immediate advantages :—

(a) The most difficult part of the navigation of the Hooghly is between Diamond Harbour and Calcutta and this part will be avoided. Navigation between Sandheads and Diamond Harbour is comparatively easy and the pilotage can be entrusted to a smaller and less highly specialised service than the Bengal Pilot Service. Ships will need to be piloted through the canal but the work will be simple compared with pilotage on the Hooghly. A reduction will also be possible in the number of Assistant Harbour Masters. No ship loading and discharging in the Docks will go out into the River at Calcutta, but some Assistant Harbour Masters must be retained to transport ships from the existing dock locks to the Calcutta or Garden Reach Jetties or moorings in the stream.

(b) There will be a great reduction on the amount of dredging to be done. The Commissioners now maintain three large suction dredgers for the maintenance of the navigable channels and these dredgers are practically solely employed on bars between Garden Reach and Diamond Harbour. Very occasionally a dredger has been tried in the Lower Reaches for short periods but the total amount of time thus spent is negligible and there is no doubt that three suction dredgers are needed to maintain the Upper Reaches at the present standard. The ship canal will probably obviate the need for any dredging in the River between Diamond Harbour and Garden Reach. With the cessation of dredging there is no reason to expect that conditions will not return to those prevailing before 1906 when dredging was begun. The depths on the bars then fluctuated greatly but there were no changes in the general regime of the River. It may possibly be considered inadvisable to leave the Port without a single suction dredger because, if there is no dredging, it is conceivable that siltation at certain places may continue to such an extent as to affect the

regime. The chances of this happening are however so remote that I think it can correctly be said that the Commissioners will be saved three suction dredgers.

2. Apart from the above positive and immediate advantages of a ship canal there are the following possible future advantages :—

- (a) The problem of increasing the available depths to vessels will be a much more limited one than it is now. The ship canal will of course mean that no bar above Diamond Harbour can affect the drafts of ships but since dredging was undertaken on its present scale conditions below Diamond Harbour have during the major part of every year controlled drafts. The Balari Bar is now the worst bar below Diamond Harbour and this bar might possibly be improved by dredging, but at other times other bars which could not be dredged have been the controlling factors. A permanent increase of permissible drafts cannot therefore be obtained by dredging and the only way of obtaining one is by river training works. Under present conditions river training works would be required from Calcutta to Sandheads but with the ship canal they will only be required below Diamond Harbour. Such wide changes take place in the position of the channel at the mouth of river that it is difficult to imagine any training works which would give a permanent improvement but this is a matter on which expert opinion will have to be taken. It is quite possible that experts will regard as more feasible the construction of training works to maintain the Rangafula channel above Saugor Island and to improve Channel Creek and the Baratola River which is narrow and in its lower reaches give a permanently deep passage to the sea. The desirability of developing this passage was advocated by Mr. Oag, Deputy River Surveyor, in a report which he recently wrote.
- (b) The construction of the ship canal will enable the Port to be economically expanded to any extent which may become necessary. It will be a simple matter and comparatively cheap to provide docks off the canal and to obtain all the advantages of concentrated development. It is true that even now we can by developing King George's Dock to its maximum extent and reconstructing the Calcutta Jetties provide for the handling of more than double the maximum traffic we have ever been required to handle in the past, but the next step beyond that would be the removal of coal shipping from Kidderpore Docks to riverside berths at, say, Ulubaria. This step would enable more general produce berths to be constructed in Kidderpore Docks if the single lock entrance was considered adequate to bear the extra strain, but this would be the limit to economic expansion. It may now seem inconceivable that the Port will ever be required to handle more than double the maximum pre-war traffic but seventy years ago the idea of a total sea-borne traffic of over ten million tons would probably have appeared fantastic. In this connection I may mention that the possibility of a big increase in traffic is an additional argument in favour of the ship canal because there is a limit to the number of ships which can move at one time in the Upper Reaches.

The cost of the canal is estimated roughly at Rs. 15 crores. Assuming that the money can be borrowed at 3 per cent and the loans are to be redeemed in 60 years the annual expenditure in interest and sinking fund charges would be Rs. 54 lakhs. It is estimated that the nett savings in revenue expenditure on account of the ship canal plus the interest and sinking fund charges on some capital expenditure which will be avoided may amount to between Rs. 22 and Rs. 25 lakhs a year ; taking the latter figure the nett increase in the annual revenue expenditure of Calcutta Port will be Rs. 31 lakhs."

Other Improvements

20. Apart from the ship-canal Calcutta has large schemes of dock development which cover an increase in the size of King George's Dock, new mechanical coal shipping plant and better laid out railway yards. These improvements will be undertaken whether the canal is built or not as is indicated in para. 2 (b) of the Chairman's note. The construction of the canal will, however, alter the proposed dock lay-out, and a decision on the canal is desirable before the Commissioners' dock improvement schemes are implemented.

Conclusion

21. As regards the proposals for a Ship Canal scheme and River Training work as suggested by the Chairman of the Calcutta Port Commissioners, the Committee feels that it cannot, on the data available before it, say that those proposals are financially sound or will effectively attain the object which they have in view. The Committee would, however, welcome the fullest and the earliest investigations of the improvements to the navigable approaches to the Port of Calcutta and the drawing up of a scheme for that purpose which would, without permanently affecting deep sea navigation in the Upper and Lower reaches of the Hooghly, provide facilities for steamers with deeper drafts to navigate to and from Calcutta at all times. The Committee therefore, suggests that the technical, financial and other relevant aspects of this or any other scheme, with particular reference to its permanent repercussions on the Upper and Lower reaches of the Hooghly, should be fully examined by experts. And in connection with the proposed extensions of King George's Dock the effect of the policy of dispersal of industries on the volume of traffic that will flow through the port in future should be fully gone into.

Cocanada

22. The only additional deep seaport on the East Coast which the Committee has considered is that at Cocanada, but the possibility of making Cocanada into a deep-sea port is somewhat nebulous and is, therefore, not considered under this term of reference but is taken later in the report in para. 60 under the 2nd term of reference which asks whether any minor port on the coast of India may justifiably be converted into a major one. It is explained in that paragraph that the suggestion to change the character of Cocanada is as yet at too early stage for the Committee to include it under this first term, as conceivably it may prove to be an engineering impossibility.

Conclusion of First Term of Reference

23. (a) Looking back at the above paragraphs readers of this report must inevitably feel that the Committee has not taken quite such a coldly economic view of the eastern port position as might have been expected of business and professional men planning a profitable course of business advancement for Government. But what the Committee has recommended are long term works. They cannot be expected to start full repayment of money spent from the day they are finished and brought into use. This is not expected of a long term work. The question is not whether these projects will immediately start paying for themselves, but whether they are considered necessary and desirable in the ultimate interests of the country as a whole.

(b) Any large expansion of trade and industry in South India will strain the Port of Madras unless the port and city are prepared to surrender their position and new trade to the Port of Cochin, even that pertaining to the Madras hinterland. Vizagapatam can never succeed till it is developed into a first class modern harbour, and the community cannot afford to write off its hopes of it becoming one. Again, Calcutta as the largest port in a country committed to economic expansion and providing the natural outlet for so many commodities suffers from physical disadvantage to an extent probably not experienced by any other port of its size and importance in

the world. Improvements of the natural approaches are, therefore, called for and without them Calcutta will continue to bewail the Hooghly river with its tidal bores and sand banks and its restriction on the size of ships.

(c) There may be a stage in every large undertaking when financial considerations are not the only or even the main ones. The value of a port is not solely to be reckoned in terms of economic integrity, and the financial side, though of the highest importance, is not always paramount. Judgment of a port is not made on the basis of a few months or even of a few years' work. It is based, rather, on the service a port renders through decades and centuries, and we must look far ahead in determining the best course of expansion.

Strategic Aspect

24. Finally we must regard the strategic aspect of the East Coast ports. We are not looking for the next war, heaven forbid, but we should be foolish to forget or disregard the warnings of the recent one. The Hooghly was a severe handicap to the military use of Calcutta, and constantly ships with heavy cargoes had to be lightened elsewhere before they could sail up to the port. No extension to the King George's Dock and no other port improvements can really make up for the limitations imposed by the River.

Vizagapatam was much under-developed. More quays, more water-space were required for the military cargoes that could have been handled there. The Navy could also have enjoyed sheltered water facilities if the port had been more extensively developed.

Madras was seriously overtaxed through the lack of protected water-space for ships and water-front for the handling of cargoes.

The demands of strategy should not be neglected and forgotten just because the war has ended, and Government may very well take to heart the lessons of the last five years. Though we are not thinking of war, but are making plans to meet peaceful expansion of trade, yet we feel that, where inadequacies were so strongly felt in war-time, the shoe may also be felt to pinch in future days of peace. This is not merely a commercial question of recommending works which will pay for themselves in due course; as already stated they are unlikely to do so for many years. Further, the ports cannot finance the big works they propose, at any rate, not entirely. It is the committee's opinion that Government should come to their aid, if only as a form of insurance against future demands both of commerce and strategy.

25. The Committee's second term of reference reads as under :—

“Whether there is justification for the conversion of any minor ports on the coast of India to major ports, if so whether such conversion is practicable; also whether there are any other projects for construction of major ports which ought to be considered”.

Major and Minor Ports

The distinction drawn between a 'major' and a 'minor' port is not mathematical. If it were merely a matter of size or quantity of trade, Calicut, carrying 600,000 tons of cargo in a year, would have been a major port before Chittagong. It is arbitrary. When a minor port by reason of size or for other reason is taken under the financial control of the Central Government it is called a 'major' port, and the major ports are Karachi, Bombay, Cochin, Madras, Vizagapatam, Calcutta and Chittagong. All the others are called minor ports, even Bhavnagar with 300,000 tons of cargo a year and Tuticorin with 500,000 tons and these come under the Provincial or State budgets. Whether it is a good distinction or not the Committee is not fully qualified to say.

For all practical purposes, however, the distinction between a major and a minor port is generally understood. The sheltered nature of a port, the well laid-out approach channels, the provision of docks, jetties and moorings, the well laid-out transit sheds, the effective railway connections, the ability to serve a very large portion of

the hinterland lying behind the port, the facilities for meeting the requirements of defence and strategy, the comparatively large volume of traffic and the possibilities of working for shipping all the year round, usually distinguish the major from a minor port.

The ports in the Indian States do not come under the control either of the Central Government or the Provincial Governments. They are developed and managed by the Rulers of the States. The same considerations which we may apply in respect of the ports of British India may be equally applied, in the broader interests of India as a whole, to the ports in the Indian States.

26. The Committee's approach to its second term of reference can be best made through the ports of Kathiawar and the Indian States as the more difficult problems come from there.

The projects at Rameswaram and Cocanada can be separately dealt with.

Place of State Port Projects in Indian Trade

27. Viewed from the all-India angle, the Sika, Veraval, Bhatkal and Vizhinjam projects have this in common, that they are the off-spring not of the Central Government nor of a Provincial Government but of Indian States, though as will be explained in its proper place, Bhatkal actually lies within the Bombay province. In considering these projects the Committee has, therefore, borne in mind that the individual States interested may conceivably go ahead with their projects just as major ports in British India, for instance, Bombay and Calcutta have done or may be doing for reasons other than those which appeal principally to the Committee, to wit, economic reasons.

The Committee regards economic India as one geographical entity and is not interested primarily in the ambitions or prosperity of individual States or of individual ports in British India. It should not, therefore, be found fault with on the grounds that it takes a detached view of the three proposals; the new port of Sika in Kathiawar (Jamnagar State), the development of the minor port of Bhatkal on the West Coast, frankly intended for the use of the State of Mysore and the proposed sheltered anchorage at Vizhinjam on the coast of Travancore. The Committee asks itself the question not whether the particular project is of advantage to Jamnagar State or to Mysore or to Travancore as the case may be, but whether it fits in with an all-India scheme of economic development and progress; though it may be in an Indian State or in British India. As often happens, the answer in each case is not a clear affirmative nor a flat negative, but the Committee in its approach to each one of these projects has tried to keep before its eye the yard-stick by which all such planning, whether it is in the Indian States or in British India, should be measured, that is, its service to the country as a whole. Judging from that point of view, the Committee feels a major port in the Gulf of Cutch between Karachi and Bombay is a necessity and considers in view of all the data that was placed before it that the Sika Scheme is a promising one.

The Problem of Customs Revenue

28. It seems to the Committees uneconomic that the country's port policy, i.e. the siting of ports and their development, should in any way be affected by the claims of all-India Customs Revenue. Yet this question of Customs has loomed large in the history of Cochin, a major port, also in that of the Kathiawar ports, and will undoubtedly be brought to the front if the little harbour of Bhatkal materialises as a port for overseas trade. A settlement has been made at Cochin and the future history of the port may possibly be free of Customs trouble, but it is by no means sure that customs policy will not affect the future of the Kathiawar Ports as it has affected their past. There is still vigorous disagreement between the Government of India and at least one of the Kathiawar States on the very question of division of Customs revenue.

The Committee would urge most strongly that this should not be ; that no consideration of customs revenue collection should be allowed to influence the use of a port, its control and the routing of external and internal trade.

Natural advantages are fair enough ; position on the coast in relation to centres of population , agriculture and industry, access from the sea, protection from weather, deep sea berths, all these are factors that should determine the siting of a port, but not the financial advantage of a Government or a State interested in revenue to fill its coffers. Competition is not to be despised but it should be conditioned by natural advantages and be found in methods of administration and in the provision of the most suitable facilities for trade ; in short, it should show itself an intelligent and far-seeing port management and not in any endeavour to secure revenue for the Power controlling the fortunes of a port, whether it be the Central Government or an Indian State.

It is finally incumbent on this Technical Committee to point out that any customs agreement which has the effect of diverting trade into unnatural channels is detrimental to the economic growth of the country as a whole.

Self-sufficient Ports

29. As a general rule, a port should be self-supporting. This may seem an obvious statement but it is by no means always borne in mind by promoters. It is, however, as pointed out in para. 11, not easy to determine whether the existing ports either in British India or in Indian States are self-supporting or not. This economic aspect of the policy of port development must be essentially qualified by another one to the effect that a port is a long term undertaking and therefore must be built and developed with an eye to the distant future. This dual aspect of harbour policy is borne in mind in considering the various schemes that were placed before the Committee for its consideration. It is obvious that there must be some temptation to the Government of a State to use its port or ports to serve its own domestic ends and, if necessary, to support them out of State revenue. Ports in British India have also, in some cases, expanded themselves for reasons of a similar character. If ports whether in British India or in Indian States, are established or developed merely for the purpose of diverting cargoes from their most favourable economic channels the Committee has no hesitation in saying that such a policy is not in the broad interests of this country. Trade for which a particular harbour is the natural outlet may easily be diverted to another harbour not so well suited if the latter by means of a subsidy from General Revenues or by income which may be received from extraneous sources such as land or buildings can reduce charges to an uneconomic level and so artificially, though not justifiably, benefit the merchants importing or exporting those cargoes.

The Kathiawar and Cutch Ports

30. Bearing in mind the above three main considerations, the subordination of local gains to those of the country as a whole, secondly the advantages of genuine competition and thirdly the avoidance of uneconomic temptations, the Committee now proceeds to deal with the projects which have been specifically laid before it and begins with the Sika scheme.

Before coming to the scheme itself we must consider the geographical and political position of Sika in Kathiawar and we must have a proportionate view of Kathiawar port problems. We are not making a detailed report on the ports of Kathiawar but only attempting to bring Kathiawar into an all-India port survey. We do not wish to be told that we have failed to give due prominence to this or that State undertaking. It is not our task to give or deny any such prominence. The Kathiawar coast forms a very small section of the sea outline of the Indian sub-continent and the only reason why it takes so large a part of our attention, apart from its internal complications, is its proximity to the important centres of Central and Upper India and its inability to take advantage of its geographical position owing to the customs barrier of Viramgam. It is interesting to note that Navlakhi and Bhavnagar are less than 700 miles by rail from Delhi while Bombay is 845 miles distant from Delhi and Karachi 907. The establishment, therefore of a first-class port in Kathiawar has much to recommend it geographically.

You do not learn much about the problems of a country by spending a few days in it even though you are so very cordially received as this Committee was in Kathiawar, and are given every possible assistance to understand the inter-port relationships between the individual States and between them and the Government of India. It is, however, not the function of the Committee to examine and assess the general position of these maritime States either as rivals between themselves or as competitors for Customs revenue with the Central Government. As stated elsewhere, the question of the Customs revenue should not be allowed to prevent the development of a port if it is in the large interests of the country as a whole. The Committee, however, would like to state that for the successful working of the Kathiawar ports and for the effective execution of the Sika scheme, the evolution of a common and unified policy of the working of the Kathiawar ports and Kathiawar railways is essential. The Committee, therefore, recommends that negotiations for that purpose may be carried on by the Government of India with the Indian States in Kathiawar.

31. It is necessary first to describe the Kathiawar and Cutch ports very briefly in order to get a balanced picture of their contribution to Indian trade and to understand how the introduction of Sika into the picture influences the whole design.

The Port of *Bhavnagar* in the Gulf of Cambay has an anchorage in the gulf; six miles from the anchorage a small harbour accommodating two ships alongside a quay; and also a further six miles up a creek, a large lighterage and sailing-vessel port. There is a 40 ft. range of tide which is a great handicap to port working and a serious dredging problem at the port. Export trade comprises oilseeds, cotton and grain and import trade wool, cloth, iron and timber.

Porbandar is an open roadstead on the west coast of Kathiawar and is a lighterage port only.

Veraval is an open roadstead on the south-west coast of Kathiawar and is a lighterage port only. It has sheltered accommodation for sailing vessels and has a scheme in view for a sheltered large-vessel anchorage with possible quays.

Port Okha.—Just inside the north-west tip of Kathiawar, has one ship-quay berth and one mooring with lighter berths; it is distant three miles from the outer anchorage. There is a dredging problem. Export trade salt, cement and oilseeds imports of coal and oil.

Bedi.—On the north coast of Kathiawar is a lighterage port only and is completely dry at low tide. The ship anchorage is six miles away. Export trade is in oilseeds, cotton, wool and salt; imports are rice, grain and sugar.

Navlakhi is a lighterage port only $1\frac{1}{2}$ miles from the ship anchorage. Export trade consists of oilseeds, cotton, grains and salt; imports of rice, iron and sugar.

32. Thanks to the courtesy and very thoughtful co-operation of the Hon'ble the Resident of Kathiawar, the Committee was able to interview the representatives of seven Kathiawar States, including Cutch, which lies opposite the north coast of Kathiawar on the other side of the Gulf of Cutch.

Representative of State	Port Concerned
Bhavnagar State	Bhavnagar
Porbandar State	Porbandar
Junagadh State	Veraval
Baroda State	Okha
Nawanagar State	Bedi
Morvi State	Navlakhi
Cutch State	Kandla

The above representatives gave the Committee the information set out in the statement below :—

Summary of information given to the Committee by Representatives of States.

I Port and State	II Approx. Annual tonnage of cargo pre- war	III Capacity in tons of cargo as at present designed	IV No. of Steamers (approx.)	V Projected Works
Bhavnagar—Bhavnagar State	300,000	3,600,000	270	New Dredger. More Lighters. One more jetty to enable port to take 4 ships and 1,000,000 tons of cargo a year.
Porbandar—Porbandar State	185,000	370,000	261	Improve approaches. Ten more lighters (50 tons capacity each).
Veraval—Junagadh State	224,000	450,000	233	Protected Harbour for ships and ship quays.
Port Okha—Baroda State	274,000	400,000	119	Quay extension and dredging. New Cranes. Target of 600,000 tons a year.
Bedi—Nawanagar State	200,000	650,000	Not given	
Navlakhi—Morvi State	200,000	500,000	163	Light the channel leading to the port and remove two small bars. Twelve more cranes and increase port capacity to 700,000 tons.
Total.	1,383,000	2,970,000		
Deduct Bedi figures ..		650,000		
Future capacity.		2,320,000		
Add Sika, replacing Bedi as port for Nawanagar State.		1,000,000		
		3,320,000		
Kandla—Cutch State	325,000	Not available	64	Can develop to meet trade requirements.

33. Whether the volume of trade passing through the Kathiawar ports will develop to the extent indicated in the figures shown in Column III of the above statement or not it is difficult for the Committee to predict. Without the addition of Sika, the traffic of Kathiawar ports, which stood pre-war at 1,383,000 tons, is expected to go up to 2,970,000 tons per annum. It is true this will be more than a hundred percent rise in the maritime trade of Kathiawar. The favourable geographical position of Kathiawar ports and their potentiality to serve the large hinterland lying behind Kathiawar will not, by themselves, be able to bring such a large expansion of maritime trade to Kathiawar. If anything like the amount of 3,000,000 tons traffic is to pass through Kathiawar, the Committee considers it its duty to point out that it will be hardly possible without very large industrial expansion in that part of India. It may, therefore, be argued whether the creation of such increased port capacity and also the Sika scheme without its being fully utilised is justifiable on economic grounds. It should not, however, be forgotten that the creation of port capacity in excess of the immediate requirements of the trade is a vital aspect of a sound port policy and is followed by important major ports in British India. Apart from this important aspect of the port policy, there are other grounds in favour of the Sika Scheme, such as the quicker handling of cargo, safer working, cheaper working, proximity to Central and Upper India and the fulfilment of the need for a deep sheltered port between Karachi and Bombay. These considerations have, therefore, largely influenced the recommendations which the Committee has made.

Sika

34. Sika lies on the south side of the Gulf of Cutch in the State of Jamnagar, some twelve miles west of Bedi Port. There is a 2,000 foot wide channel at this point, 36 ft. deep, with an easy entrance from the sea and affording reasonably good shelter.

The site was surveyed by the Admiralty so far back as 1851 and again by the Royal Navy in 1943. Acting on this latest survey it is now proposed to build on a reef on the west side of the Channel a ship-quay 1,300 ft. long with a water depth of 32 ft. at quay side. This quay will accommodate two ships of 500 ft. in length or alternatively three or more smaller vessels. Ship working at this quay has to cope with a 22 ft. rise and fall of tide. A lighterage wharf is to be built in continuation of this quay southwards to serve vessels lying at moorings in the channel close to the wharf. An oil berth is also contemplated and port workshops and future factories all with water frontage. Land service is by metre gauge railway to connect with the main line from Port Okha to Jamnagar, passing 15 miles away. The most costly part of the Scheme is likely to be the connection between quayside and railway layout. There appears to be no dredging problem. It is designed to handle about a million tons of traffic annually and is estimated to cost about Rs. 1,05,00,000.

35. In conclusion the Committee is of the opinion that there is a need for a major port between Karachi and Bombay in the Gulf of Cutch and feels that, on the information at its disposal with particular reference to surveys made and schemes in prospect, Sika is the most promising site for the purpose ; and recommends that the necessary steps for the execution of such a scheme be taken. The Committee further suggests that with a view to providing effective and quick rail transport without transshipment to areas in Central and Upper India, on which traffic the port would need to depend largely for its economic prosperity, the laying of a broad gauge railway line from Sika to Viramgam or any other suitable station should form a part of the Scheme.

Kandla

36. The port of Kandla in Cutch presents a different problem altogether. Here we have a natural harbour to all intents and purposes as potentially promising as Sika. It has deep calm water approaches and no particular dredging problem. It is at least as near to the great cities of Central and Upper India as the ports across the gulf of Cutch in Kathiawar ; there are no constructional difficulties and the port already has a jetty alongside which only medium sized ships can lie. Cutch, however, is, unfortunately for itself, cut off from the rest of India. The State has been slow to develop and is said to be markedly behind the times. This is as much due to its lack of enterprise according to modern standards as to its geographical isolation behind the Rann of Cutch, that peculiar desert sometimes dry, at times waterlogged, a desolate area, that stretches for 200 miles or so between the State and the rest of India. It has no road or rail connection with India.

The chief bar to its development as a port of India would appear to be its geographically isolated position. Further the State must give up its own currency which it still maintains and it must come into Customs union or Agreement with the Central Government. These are not matters within the scope of this Committee ; we simply record them and note that a good natural port is waiting for the removal of these obstacles in order to become, so far as the Committee can judge, a useful and desirable addition to the ports of India.

Veraval

37. The only other scheme in Kathiawar for a ship harbour specifically brought to notice of the Government of India and referred to this Committee is that of the Junagadh State for its port at Veraval. This is an open roadstead on the south-west coast having a sheltered basin for sailing craft and lighters. The State proposes to convert this into a port affording sheltered anchorage and possibly later with quays for ocean going steamers. At present the State is asking Government

or help to get a naval survey made of the port possibilities. On figures shown to the Committee the port is now paying its way on a cargo of 220,000 tons a year but whether it could do so on a fully protected port is quite another matter. No engineering report has yet been made, and failing that, the Committee cannot usefully comment on the prospects of a deep sea harbour at Veraval.

Other Ports

38. As shown in the Statement in para. 32 above other ports also have schemes for the future, not for deep-sea ports in particular but for improvement on their present lines; Okha for another quay, Bhavnagar for two more quays, Navlakhi for development as a most up-to-date lighterage harbour which it is already. But in considering all these schemes the Committee comes up against the same problem. Where is the traffic expected to make these schemes an economic success? It is not in the interests of India as a whole to encourage uneconomic schemes, and it is from the point of view of India as a whole that the Committee views Kathiawar.

Railways

39. The Committee is not competent nor is it asked to discuss Railways, but these have a bearing on the Kathiawar Ports as all ports are served by rail and in no other way. Roads are poorly developed and there are no inland waterways. The impression it gained, however, from discussions on the spot is that, so far as mileage goes, the Railways are ample for the traffic and no special expansion save in additional crossing stations should be needed for some years to come. For rolling stock the Railways have the metre-gauge wagon pool on which to rely. In rate quotations they are controlled by the Railway Board.

At the same time it is very doubtful if the best use is made of the railways and it is obvious that the complicated net work of lines in different States and the competing interests of the ports they serve cannot give an efficient and economic service in the interests of all to the maritime trade passing through this part of India. A bottleneck at the Customs Barrier at Viramgam no doubt militates against the working of an efficient port policy. The mere removal of this barrier is not the only, nor indeed the first improvement that is to be sought. As stated by the Committee in para. 30 above, the Government of India should assist the Indian States in the evolution of a unified port and railway system and should open the necessary conversations with them for that purpose.

Bhatkal

40. The Committee can best approach the problem of harbours in Indian States and British India with the assumption that such harbours are national harbours serving or intended to serve the country of India and in no way to be limited by political boundaries. It is on these lines that it takes up the Bhatkal proposal. If the hinterland of Bhatkal were British India and not an Indian State would a port at Bhatkal be regarded as a good economic proposition? If the Government of Mysore regard the opening of Bhatkal as a profitable paying concern should they not press the Government of India to open it up as a national port rather than prolong an unprofitable argument about jurisdiction?

While the Committee can sympathise with the ambition of a State to have a port of its own, that is an affair of sentiment which should not blind us to the fact that we have to keep in view economic development and are concerned with the interests of the country as a whole. We should regard Bhatkal through economic lenses.

41. The roadstead of Bhatkal lies on the West coast of India some 300 miles south of Bombay, about 100 miles south of Mormugao and 300 miles north of Cochin. It is situated at the southern-most tip of the Bombay Presidency within twelve miles of the Madras Presidency to the south and fourteen miles from the Mysore

border to the East. At present it provides harbourage for small sailing craft, except in the monsoon when it is too exposed for an anchorage, and proposals have been made to locate a sheltered deep-sea port at this place.

Past History of the Scheme

42. The possible development of Bhatkal into a deep-sea port has been under consideration by the Mysore Government since the year 1915 when Sir Francis Spring, late Chairman of the Madras Port Trust, made a first report on it. The Mysore Durbar also asked the Government of India for permission to extend the Shimoga branch of the Mysore Railway down to Bhatkal on the coast and to build a harbour there, jurisdiction and control of both railway extension and the harbour being ceded to the Mysore State. The latest engineering report that we have on the subject of the proposed port is one by Mr. A. G. Lyster of the firm of Sir James Wolfe Barry & Co. made in December 1919. Mr. Lyster produced schemes for separating the Bay of Bhatkal from the open sea by groynes and developing an inner creek known as the Sharabi river bed as a fully protected harbour. This scheme was estimated to cost Rs. 144 lakhs and was expected to enable the proposed port when developed to deal annually with 2,300,000 tons of cargo. He also described another feasible scheme different in detail but not in essentials which would admit of better expansion but would be a good deal more costly. He considered that a first instalment of works for the former scheme could be initiated which would cost about Rs. one crore leaving room for future extension up to the above total figure of Rs. 1,44,00,000.

At that time, in the year 1919, it was estimated that trade amounting to about a million tons of cargo would be required to justify the expenditure of Rs. one crore but unfortunately the latest traffic survey made in 1919 only promised about 200,000 tons in a year. The scheme was therefore dropped in the year 1923 and was not revived until much later.

The project has now been again re-opened by the Mysore Durbar and is one of the matters referred to the Ports Technical Committee for investigation and advice.

Railway Connection

43. Apart from the Port project there is also the Railway required to connect the Port with the Mysore State Railway at Talguppa on the Shimoga Branch. The line to be constructed will be 49 miles long including a fairly severe ghat section, and is estimated to cost about 110 lakhs of rupees.

The General Manager of the Mysore Railway has estimated that, taking the port with the whole Railway from Shimoga to Bhatkal, a distance of 111 miles, as one project, a return of 4% on the capital outlay can be expected, but it is difficult to say whether one should regard as one indivisible project a railway already constructed (that is from Shimoga to Talguppa) and a newly proposed railway (Talguppa to Bhatkal) and port at the latter point now under consideration. Possibly the thought in his mind is that the railway line was extended from Shimoga to Talguppa with the eventual target of Bhatkal port already in view but it seems sounder to keep the future project quite distinct from the one already accomplished which must have had its own justification in the local traffic between Shimoga and Talguppa and the great hydro-electric scheme at Jog Falls.

Geographical Position

44. The only port of any size between Bombay and Cochin is Mormugao, a foreign port, and if only we could regard both Mormugao and the proposed port of Bhatkal as ports of India, we would ask ourselves whether from this view-point a port additional to Mormugao between Bombay and Cochin is justifiable. Arsikere which we may take as a central point of the rich Mysore country is distant from the respective ports as under :—

Mormugao	.	.	.	332 miles (calculated mileage on ghat section).
Madras	.	.	.	325 miles
Bhatkal	.	.	.	179 miles.

The opening of the last-named as a port will greatly reduce rail haulage from the coast to this part of the hinterland, and this factor is of great importance, particularly with new industry. The industrial district is going to be round the new electric power works at the Jog Falls and between them and Shimoga which is distant from the respective ports as under :—

Mormugao	344 miles
Madras	393 miles
Bhatkal	111 miles

There are, therefore, geographically grounds for considering the possibility of a port at Bhatkal. Such a port would divert Mysore State traffic from Madras to a figure of 50,000 to 100,000 tons a year and it is thought that it might affect Mormugao to a somewhat similar extent. At the same time the hinterland of Bhatka consisting of the rich and progressive Mysore State would be very much better served by this nearby port than by the more distant harbours of Madras and Mormugao. There is not a great deal to be gained by laying out a new port which has only the merit of diverting cargoes from other ports, but this proposal would definitely be an assistance to the development of Mysore. The question really is one of rupees annas and pies and this is dealt with in the two succeeding paragraphs.

Traffic Prospects

45. The General Manager gave the Committee an interesting survey of traffic prospects of the port and railway and this is summarised in tons as follows :—

1,18,000	Imports of existing trade.
30,530	Exports of existing trade.
25,000	Expected traffic to and from country in neighbourhood of port.
61,500	Traffic from the Shimoga-Bhatkal Line.
3,15,000	Traffic to be newly developed.
Total	5,50,050

The Committee discussed this estimate at some length with Mr. M. Venkatesh Acting General Manager in relief of Mr. Rangachar, and is inclined to think that the figures are to some extent an over-estimate. For instance, there are not very good grounds for anticipating 25,000 tons of local traffic nor as much as 61,500 tons of traffic from the Bhatkal-Shimoga Line. As regards new traffic the figure of 315,000 tons includes export of 70,000 tons of steel castings, pig iron and manufactured iron and steel articles, also 10,000 tons of sugar from the new irrigation areas surplus to the State's own requirements and those of the neighbouring provincial areas, and finally 40,000 tons of surplus grain. The Committee could not itself conduct a traffic survey but it considers that the figures quoted above are on the high side and that the figure of total trade is unlikely to exceed annually, say 400,000 tons, for many years to come.

Financial Implications

46. (a) It is not very easy to estimate the return to be expected on a combined port and railway venture without a detailed enquiry by railway and port experts which will take a long time. The Committee at this stage, however, makes the following rough calculation :—

	Rs.
Capital cost of Talguppa-Bhatkal Railway	1,10,00,000
Capital cost of Port	1,44,00,000
Total	2,54,00,000

Interest on Port capital cost of Rs. 1,44,00,000 at 3½% is Rs. 4,32,000. Repayment of loan advanced to the port in 60 years on the usual terms allowed to Port Trusts at 0.6% is Rs. 86,400. Total annual debt charges—Rs. 4,32,000 *plus* Rs. 86,400 = Rs. 5,18,400.

(b) The annual traffic earnings on Port traffic at, say, Rs. two per ton would on 400,000 tons amount to Rs. 8,00,000, and as against this operation and maintenance are likely to cost not less than Rs. 3,00,000 a year. This shows a total debit on the port working of Rs. 8,18,400 against a credit of Rs. 8,00,000. There will, however, be additional receipts from ships' dues, warehouse charges, and other income incidental to the working of a Port Trust.

(c) This then means that the investment on the port will be able to earn not less than 3%. That cannot be called an uneconomic proposition. The Committee, therefore, considers that, on the data submitted it is both a practical and good financial proposition. Moreover, the Committee is of the opinion that the development of Bhatkal as a major port is essential for providing a good economic outlet for the trade of the large and rich hinterland of the Mysore State lying behind it. In view, however, of the fact that the engineering report and part of the traffic estimate were made a generation ago, the Committee considers it necessary that a fresh report regarding the engineering possibility of the scheme and fresh data of traffic should be called for.

Vizhinjam

47. The site of Vizhinjam is a Bay on the West coast of Travancore State nine miles south of Trivandrum between that place and Cape Comorin and about 120 miles distant from the major port of Cochin. The remoteness of the ports of Alleppey and Cochin which serve Travancore through the canal system is said to be proving a serious handicap to industrial expansion of the southern part of the State. The present facilities for sea traffic in this area extend mainly to beach loading and unloading, and in the monsoon season all work is suspended.

48. A port is proposed at this place primarily in the interests of the mineral traffic to Europe and America, the most important item being ilmenite, large deposits of which are to be found in the neighbourhood. Particulars of the project have been given to the Committee by the Dewan of the Travancore State, but whether the expected traffic will materialize is uncertain. There is no proposal to build a quay port but only to provide sheltered moorings in the Bay where ships can lie at anchor to receive cargo brought to them from the interior or along the coast by country craft. Villinjam (Vizhinjam) Bay lies at the scoured end of an extensive rock promontory standing out about half a mile and is about one and a quarter miles long terminating northward at Kovalum point. The bay is a shallow segment in shape measuring about two miles long and a little under half a mile wide. It is rounded off at the southern end by another rocky headland of less extent than the northern one. The northern promontory shelters a cove extending some 300 yards behind the point, in which deep water is maintained by scour round the headland. In the area of the bay the five and ten fathom lines are close inshore, the former being at some 300 yards and the latter at about three quarters of a mile out. The set of the waves is approximately coincident with the long axis of the bay, and the beach is generally steep. At about a quarterway point on the perimeter a finger of rock from the higher ground behind bears down into the sea and causes a shallowing of the sand beds. These rocks roughly mark the limit of the sheltered area.

Envisaging the enclosure of the more sheltered part of the bay, an area of some forty acres might lie within the back-waters. But an examination has proved there is available some sixty acres of backland which could be conveniently brought into the harbour area. A large portion of this is not more than one or two feet above sea level, and the remainder is little higher than ten feet.

Briefly, harbour works proposed consist of a groyne between the two headlands of the bay protecting the mooring area particularly on the north-west side and in addition an unknown quantity of dredging in the bay itself. Road communications are good, but linking up the area with the canal system presents some difficulty and will involve tunnelling or deep rock cutting.

49. A very rough estimate of cost of the project has been given as Rs. 3 crores but this must not be regarded as an entirely satisfactory figure since a full engineering report on the scheme has not yet been received. Everything depends on the length of the groyne, its required strength to resist the monsoon and the amount of dredging to be done in the Bay. Not until the engineering report is made and studied can it be said with certainty whether or not the scheme is a practicable one.

50. The main point of the scheme is to provide a sheltered anchorage for ships of at least 5,000 tons, that being the size of vessel that is expected to carry the mineral traffic to countries overseas. Although minerals constitute the chief cargo in view there are other products in the hinterland behind the port such as mica and timber which will be benefitted by this proposal. As an alternative to finding shipping facilities at Vizhinjam they have long distances to cover by backwater to other ports such as Quilon, Alleppey and Cochin.

51. It is not possible for this Committee, without seeing the engineering report above referred to, to judge whether this proposal is an economic one or not. Presumably the Travancore State will give effect to the proposed work if it is in the interest of the State itself to do so.

Rameswaram Canal

52. Rameswaram is an island at the extreme south end of India just west of Adam's Bridge which lies between India and Ceylon. The South Indian Railway (metre gauge) runs through Rameswaram to Danushkodi which is the terminus of the ferry steamer service to Ceylon.

For very many years there have been proposals for connecting the Bay of Bengal with the Arabian Sea by means of a canal between India and Ceylon joining the Gulf of Manaar with Palk Strait. A canal actually exists at Pamban on the western tip of Rameswaram island but this canal will only take ships of 11' draft and cannot be deepened without great difficulty. It has, therefore, been proposed that a canal should be dug instead across the island of Rameswaram. It is intended to be about five miles long, 90' wide and 27' deep at low water, so as to accommodate ships of 26' draft; locks at each end are proposed, these to be 31' deep to allow for future development.

53. The above project was examined and reported on by Sir Robert Bristow, one time Chief Harbour Engineer to the Government of Madras. At that time the construction of the canal was under investigation by the Madras Government in the interests of the minor ports of the Peninsula and the country craft serving them; it also had the support of the South Indian Railway who were looking for a good port for their ferry steamer service. The work was, however, estimated to cost Rs. 110 lakhs and with a canal dues charge on ships of nine annas per net ton it was considered unlikely that the canal would pay its way and the scheme was dropped.

The proposal was, however, again brought to the fore by the naval authorities in 1942 when a safer and less exposed access to the ports in the Bay of Bengal was a matter of strategic importance, the only available route round the Island of Ceylon presenting great danger of enemy interference. Later the proposal was again taken up by the South Indian Railway who are dissatisfied with the terminal arrangements at Danushkodi and want to make an improved link with their Ceylon neighbour. Finally the scheme has been included as Serial No. 46 in the Madras Government's post-war development schemes published in 1945.

54. The main advantage claimed for the proposed canal is the ~~shortening~~ of the distance between the West and East coasts of India. The Committee has gone into this and finds comparative distances as follows :—

Value of the Canal as a Short-cut

<i>Cochin to :</i>	<i>Calcutta</i>	<i>Madras</i>
<i>Via Ceylon Coast</i>	1415 miles	
<i>Via the proposed Canal</i>	1170 miles	
	Saving	245 miles
	<i>i.e. 24 hours at 10 s.</i>	
<i>Via Ceylon Coast</i>		887 miles
<i>Via the proposed Canal</i>		571 miles
	Saving	316 miles
	<i>i.e. 32 hours at 10 knots.</i>	
<i>Colombo to :</i>	<i>Calcutta</i>	<i>Madras</i>
<i>Via Ceylon Coast</i>	1136 miles	
<i>Via the proposed Canal</i>	1012 miles	
	Saving	124 miles
	<i>i.e. 12 hours at 10 knots.</i>	
<i>Via Ceylon Coast</i>		597 miles
<i>Via the proposed Canal</i>		406 miles
	Saving	191 miles
	<i>i.e. 19 hours at 10 knots.</i>	
<i>Aden to :</i>	<i>Calcutta</i>	<i>Madras</i>
<i>Via Ceylon Coast</i>	3183 miles	
<i>Via the proposed Canal</i>	2940 miles	
	Saving	243 miles
	<i>i.e. 24 hours at 10 knots.</i>	
<i>Via Ceylon Coast</i>		2655 miles
<i>Via the proposed Canal</i>		2334 miles
	Saving	321 miles
	<i>i.e. 32 hours at 10 knots.</i>	

Time charges *i.e.* cost of Insurance, Messing Wages, Stores, etc. to a Shipowner these days are naturally much higher than they were pre-war while this also applies to the cost of bunker coal which at present is double what it was before the war.

The steamers at present used on the Coast have an average registered tonnage for purposes of dues, of about 3300 tons, and it is understood proposed Canal dues are Re. 1 per gross registered ton which will mean Canal dues per ship of about Rs. 3,300.

It is understood that these figures are not likely to be an incentive to ship owners to utilize the Canal particularly since running costs for ships will presumably decrease as we revert gradually to more normal conditions.

55. The timings given are worked on actual distances and do not take into account the slowing up of speed when approaching the Canal, delay waiting to enter the Canal and also reduced speed when going through it. In practice, therefore, the saving in hours when going through the Canal would work out to be considerably less than the figures given above. Quite apart from this there are the dangers of navigation in confined waters which introduce the element of additional hazard by comparison with the route via the Ceylon Coast where vessels, being well out at sea are able to proceed at full speed all the time. In the Pamban Pass currents set southward during the North East Monsoon and northward during the South West ; a minimum of five to six knots is frequently obtained rendering navigation at times both difficult and dangerous. Again official sailing directions say that, when approaching the Pamban Pass from the Southward, caution is necessary as the islands fringing the Coast are very low and there are no hills or conspicuous landmarks, while during the South West Monsoon a thick haze frequently hangs over and obscures these low islands. In such circumstances any Shipowner would consider that, quite apart from the time factor, a slight saving in distance on the route via the Canal does not justify the extra navigating risks and the possibility of accidents.

The above figures are based on the present average coastal steamer. When it comes to the deep sea trades the tendency will be for vessels to be faster and with larger tonnage while many of these vessels will be using diesel oil which saves coal and in turn will reduce their costs for bunkers. Faster speed means a reduction in the time shown as saved even without taking into account the accepted delays when making the Canal, waiting to enter, the passage through and extreme caution to be exercised in the waters on both sides of it. Higher tonnage too will mean higher Canal dues.

Weakness of the Project

56. The advantage of the proposal from the point of view of the Madras Government is concerned with the possible use of the Canal by sailing craft and the increased trade of the minor ports. It has been suggested that developments in shipping for coastal trade may be in the direction of sailing ships with auxiliary engines or of small steamers of about 500 tons. If there is anything in this, the present Pamban canal with a depth of 12' will probably be inadequate for the needs of the coastal service and it might prove difficult to deepen ; but there is no clear indication of any such development in ship design at the present time.

57. The naval authorities have dropped their support of the scheme now that the strategical necessity for this canal is no longer prominent and, though the construction of the canal would shorten the distance between Cape Comorin and Trincomalee on the East Coast of Ceylon by about 170 miles and would give much better protected transit between this naval port and the West Coast of India, the sea approaches to the canal are not very good and the canal itself would in time of war be vulnerable to hostile air attack.

58. In the fourth place, the South Indian Railway is still pressing its case for a better terminal site than Danushkodi at the west or Indian end of their Ceylon ferry service. Danushkodi apparently is a very unsatisfactory terminus and cannot readily be improved. If, therefore, the project of the canal at Rameswaram were carried through, the South Indian Railway would, it is believed, take advantage of the canal works to place their ferry terminus at the site of the canal. At the same time the Railway is definite that it has no interest in the canal scheme as such and is only concerned with the best siting of the ferry terminal in relation to the canal if built.

59. In conclusion, therefore, the Committee is of the opinion that the Rameswaram canal project is unlikely to prove a practical success from the commercial point of view.

Cocanada

60. This is an important town on the East Coast of India and headquarters of a district. The value of its trade was in 1938-39 Rs. 4,62,67,263.

It is situated about 90 miles by rail south of Vizagapatam and is served by a fairly well protected roadstead, which in cyclonic weather is said to provide the safest anchorage on the east coast.

A report was made on this and other ports on the Madras coast by Colonel Du Cane of the firm of Sir John Wolfe Barry, Lyster and Partners in 1920. With regard to Cocanada the Report was discouraging. The Consulting Engineer thought that development in a big way would be seriously affected by the all-prevailing East Coast sand-travel and that the development of Vizagapatam into a major port would remove justification for large expenditure at Cocanada, less than 100 miles to the south of it.

In 1923, however, the Madras Government received a more optimistic report on Cocanada to some extent sponsored, but not written, by their Harbour Engineer Sir Robert Bristow. The Marine Surveyor, who actually wrote this report, gave his opinion that the conditions of sand movement affecting the port were tending towards equilibrium and that a sheltered harbourage could probably be anticipated for the future.

This anticipation is now confirmed by the Presidency Port Officer who in 1944, i.e., 20 years later, wrote a report to the Madras Government containing preliminary plans and estimates for a quay port of large size at this place. The project now stands at the stage that the Madras Government have asked the Government of India to recommend to them a competent harbour engineer to advise on the future possibilities of Cocanada as a deep-water port.

The port is served by the Madras and Southern Mahratta Broad Gauge Railway and is the distributing centre of oil imports intended for the large cities of the Kistna and Godavari deltas, such as Bezwada, Guntur, Rajahmundry. This oil is landed by means of barges from the tankers lying in the anchorage.

Moreover, the large hinterland including the State of Hyderabad is expected to be widely developed when the great Ramapadasagar Dam project on the Godavari river comes into being. It is true that Cocanada is comparatively nearer to this hinterland than both Vizagapatam and Madras; that is, however, not the only consideration to be borne in mind in judging the necessity of developing the Cocanada Harbour into a major port.

To sum up its view on the proposal for developing the Cocanada harbour into a major port, the Committee does not consider it likely to be essential in the interests of future trade or necessary for the purposes of defence and strategy. The Presidency Port Officer and other Officers of the Madras Government are, however, emphatic that the East Coast sand problem does not exist here and that a deep sea harbour can be obtained here at a cost of only Rs. 1,18,00,000 without involving heavy commitments in maintenance dredging. The Committee is, therefore, of the opinion that the Madras Government's request for an engineering survey of the Cocanada proposal may be complied with and the report in connection with the scheme may be invited.

Line of Approach

61. The third term of reference to the Committee reads :—

“What steps are necessary to develop minor ports in order to meet probable demands of coastal shipping traffic”. ———and in taking up this reference the Committee was immediately faced with the problem of determining the best course to adopt in order to answer the question put to it. Four months have been given to the Committee in which to deal with all three terms of reference and there are nearly 200 minor ports on the Indian coast not counting those within the borders of Indian States; it was obviously not practicable that we should visit each and every one or even a large proportion of these and detail the steps to be taken to develop them all. The Committee, therefore, decided to

treat the subject in a more general way and to try and indicate the manner in which the development of the ports should be undertaken on broad lines. In this part of their task the Committee has had before it the Planning and Development Reports of the Maritime Provinces and the proposals made by Indian Maritime States for the opening up of their own coasts to sea trade. It has seen also the applications of various commercial bodies and of private parties for consideration of individual ports and port-projects. Each of these is dealt with in its place. Many minor ports are not susceptible of much improvement owing to natural disadvantages such as unstable sand-banks, the vagaries of river channels and the often incalculable forces of ocean tides and currents: many ports, which once were prosperous, have become backwaters of trade the bulk of which has gone elsewhere with the changes in distribution of population; many of them have been ruined as they have been allowed to silt up owing to the policy of the Railways, many have retired into obscurity because trade has been to a large extent concentrated on the seven major ports where ships' cargoes are handled on a large scale having road or rail or canal communication in every direction and with facilities provided far beyond the means of the exposed coastal anchorage or a small creek. Quite a few, however, in spite of poor facilities have carried a large tonnage of cargo which has continued to be routed through them owing to their favourable geographical position and comparatively low cargo charges.

The Maritime Provinces and States

62. The maritime provinces are five in number Sind, Bombay, Madras, Orissa and Bengal; and the coast states are those of Cutch, Kathiawar and Travancore. Following the lines of the last paragraph the Committee began by referring to the Planning and Development programmes of the above Provinces and then proceeded to interview the Governments and States concerned who had in view schemes of improvement for their minor ports. Of the Provinces, Sind and Bengal had no proposals of sufficient magnitude to put forward, while Orissa had only one for the improvement of Chandbali near Cuttack; Bombay had no specific case to press but wished to offer general suggestions; Madras, on the other hand, has a substantial port-development policy. The Committee, therefore, decided in the comparatively short time at its disposal to concentrate its investigation on the two provinces which were most interested in their littoral sea-trade and where the successful use of the small harbour facilities along the coast is of definite importance to the economic future of the country; these two provinces are Bombay and Madras. As regards the maritime states, proposals that have been made are dealt with above under the appropriate headings.

Government Policy in Shipping and Railways

63. At a very early stage it became apparent to the Committee that the future history of the minor ports is linked with the Government's policy in respect both of Shipping and Railways and dispersal of industries. We cannot say that now we will settle the future of the minor ports and shut our eyes to their connecting links with the rest of India. It has been said many times that a port is a gateway through which trade passes from sea to land and *vice versa*. A minor port is, if you wish, a postern or a wicket-gate, not of so much importance as the main entrances, but yet performing a definite service, and that service clearly dependent on ships on one side of the gate and railway trains and road connections on the other.

If Government are resolved that the sea-path round the coast of India is to be put to its best possible use it is not only necessary that ports, major and minor, should be fitted to pass the trade, but also that steps should be taken to rationalize the means of transport both by sea and land and discourage in the national interests of the country any unfair and uneconomic competition on the part of either. Should considerations of high policy require that the railway lines running parallel to and

close to the coast all the way from Calcutta to Tuticorin should be used to their maximum carrying capacity, as to all intents and purposes they have been in the past, ignoring the necessity of maintaining and developing the comparatively cheaper form of transport by sea, then the character of the eastern coastal ports need not be changed. They have their trade now, not very great, apart from coal and groundnuts, and can be content with small improvements such as every undertaking requires to keep alive and abreast with the times.

The present carriers of trade, i.e. large or moderately large ships upto 5500 gross registered tons that lie well out in the roadstead and the small sailing craft of 50 to 100 tons that nose their way into the creeks are the best medium for coastal and even foreign trade requirements at the minor ports. If deep water berths and channels are to be provided for such ships, they will be both difficult and costly to maintain and will need a large trade to pay for them. At the present time the Governments who have the minor ports in their charge have, therefore, not considered it their duty to carry out such large improvements to these ports. The Government of India have, however, announced in their latest policy that they want to develop national shipping. If such shipping is encouraged and developed and if railways are laid out with a view to feed these minor ports, the Governments will have to consider whether in those circumstances it will become a practical and economic proposition to provide deep water berths and channels for shipping at such ports. Till that time shipping will have to put up with the existing conditions and to continue to work in the roadstead as it is doing at present.

Sand Movement

64. It is desirable to emphasize that, while minor ports of the present type, consisting of roadsteads for ships and creeks or estuaries for lighters and sailing craft, are cheap to maintain and can deal with a quantity of trade, a little roughly perhaps, but still with reasonable speed and safety, the next development, the deep-water channel and quay berth, is not necessarily feasible at any minor port except at great expense, and any scheme for such a work requires very expert engineering advice and a sure trade return, for it will cost money.

The trouble is mainly sand-movement. This on the east coast takes the form of what is known as the littoral drift and on the west coast the periodical silting up of channels which means dredging—that bugbear of harbours—and the blocking of harbour entrances. The littoral drift on the east coast requires a brief explanation.

It is a widely accepted view that the East coast of India is an eroding coast, being exposed to the prevailing ocean current which beats northwards from Australia and that the sea has a tendency to encroach on the land. This sea-action is counteracted by the accumulation of silt brought down to the coast by the big rivers, the Mahanadi, the Godavari, the Kistna and the Cauvery. The silt from these great rivers, being washed northwards up the coast by the South West Monsoon and down the coast by the returning North East, replaces the soil eroded by the sea and so maintains the coast line in a rough equilibrium. Where, however, the coastal flow of silt and sand is obstructed, as for instance by a groyne built out from the coast line into the sea, the sand tends to accumulate on one side of the obstruction and the natural erosion to continue in an aggravated form on the other and we are up against the sand-travel problem about which so much has been written. This is the problem at Madras, now, it is hoped, approaching solution, and a similar problem exists at Vizagapatam which is still not completely solved.

There is reason for thinking that at any point on the East coast where an attempt is made to lay down a deep-water harbour capable of taking large ships this sand-travel bogey will have to be faced. The development, therefore, of any minor port on the coast into a major one depends first of all on answering the question how to design a deep-sea basin with a deep-sea entrance and keep that entrance clear of the coastal sand-drift.

In conclusion, if it is desired to change the character of the minor ports on either the east or west coast, to convert them from roadsteads with small-craft facilities in shore into sheltered harbours in which ships of 1000 tons and upwards can lie against a quay, a maintenance dredging problem has inevitably to be faced and sufficient trade has to be developed to cover the dredging costs. Railway and Shipping Policy hitherto followed does not encourage this change in the minor ports.

Does Trade follow the Facility ?

65. Even supposing that the natural difficulties could be surmounted with economic success it is by no means certain that the development of the small coast port with its resultant diversion of trade from the major ports is a good policy. It is said that the trade will follow the facility that, if you build a good harbour, the country round will develop and the trade to make the harbour self-supporting will grow up of itself. But this is a generalization that must be admitted with caution. The chief centres of Indian trade are not on the coasts except for the great port cities and the only places where a chance has been taken and where the port has definitely preceded the city and trade are Karachi, Cochin and Vizagapatam, all of which were small country towns until their port construction rescued them from comparative obscurity. There were good reasons in the past for putting these three places on the road to greatness, but are we to extend the policy and try to create modern trade centres of lesser magnitude all round the coast ? Although there are undoubted climatic advantages in the proximity of the sea it would, we feel, be quixotic to try and force the coast towns of medium size to develop as port-towns when as a matter of fact the main trade and population centres, excluding the major ports, are for the most part far in the interior and are themselves served by the major ports. This is not a case in which trade follows the facility but rather the other way about, the facility will follow the trade. When substantial agricultural or industrial growth near the coast demands better port communications, then is the time to think of providing the facilities. To draw up a scheme of better ports at intervals round the coast in the belief that trade will come to them is to put the cart before the horse. The Committee would generally prefer to see the trade prospects first before building new channels for it.

Ports of the Bombay Province

66. There are 75 minor ports in the Bombay Province, 25 of which are north of Bombay and 50 to the south. All these ports are very small in size and vary in importance from Broach which passes through traffic worth about Rs. 88 lakhs in the year and Ratnagiri Rs. 62 lakhs down to a little port such as Vijaydurg which carries only about Rs. 12 lakhs worth of traffic. The ports north of Bombay have to compete with the B.B. & C.I. Railway which follows the coastline closely from Bombay to Broach. The ports south of Bombay on the other hand suffer from having no railway communication to bring them traffic, the railway passing 50 to 100 miles away inland.

It seems likely that the alignment of the B.B. & C.I. Rly. along the coast will prohibit any large development of the ports north of Bombay for coastal traffic. On the other hand it is possible that road development, if and when made, may bring more trade to the coastal ports south of Bombay.

Bombay minor ports are not used for foreign trade to any appreciable extent, thus differing essentially from the ports on the East coast of the Madras Presidency with their groundnut trade.

The report of the Bombay Minor Ports Committee appointed in 1937 holds out no hopes of any substantial development of the minor ports and no more recent proposals than those of that Committee have been made. Further, no minor port schemes of importance are included in Bombay Post-war Reconstruction and Development plans.

The following statement of the value of coastal trade for the year 1936-37 gives a useful guide to the size of the ports and the smallness of this trade. It is recorded in the Bombay Minor Ports Committee's Report.

Serial No.	Ports	Imports	Exports	Total
		Rs.	Rs.	Rs.
1	Dhollera	1,93,000	4,02,000	5,95,000
2	Broach	39,06,000	48,71,000	87,77,000
3	Surat	29,73,000	10,79,000	40,52,000
4	Bulsar	11,71,000	7,96,000	19,67,000
5	Revdanda	12,43,000	10,89,000	23,32,000
6	Bankot	22,00,000	6,41,000	28,41,000
7	Dabhol	28,73,000	10,98,000	39,71,000
8	Ratnagiri	43,52,000	18,72,000	62,24,000
9	Jaitapur	22,25,000	3,15,000	25,40,000
10	Malvan	31,65,000	6,10,000	37,75,000
11	Vengurla	20,50,000	10,78,000	31,28,000
12	Karwar	10,00,000	6,07,000	16,07,000
13	Sannibatta	9,23,000	11,02,000	20,25,000
14	Honavar	16,84,000	11,53,000	28,37,000
15	Jaigad	11,67,000	60,000	12,27,000
16	Vijaydurg	10,31,000	1,86,000	12,67,000
17	Bhatkal	4,21,000	17,000	4,38,000

67. Members of the Committee were, by the courtesy of the Bombay Steam Navigation Coy., given the opportunity of visiting some of the southern ports by sea, and the Bombay Government kindly permitted the Collector of Central Excise and the Deputy Superintendent of Lighthouses to accompany them.

In the course of discussion with these officers the following points emerged as worthy of consideration :—

General Proposals for Improvement

(a) It may reasonably be accepted as a matter of long-term policy that all minor ports of the Province should eventually be capable of taking close inshore sea-going power-launches of maximum 8-foot draft and sailing vessels of maximum 10-foot draft with or without auxiliary engines.

(b) Practically all the minor ports are capable of dealing with craft of the above description or can be enabled to do so at comparatively small expense. Such craft should be able to work their cargoes alongside jetties at Gogha, Kavi, Broach, Surat, Bulsar, Bilimora, Navsari, Dahanu, Bassein, Varsova, Revdanda, Bankot, Dabhol, Ratnagiri, Devgad, Achra, Vengurla, Redi, Karwar, Tadri, Ankola and Honavar. While, however, the works required to meet the

above standard are small, they may sometime be necessary and without them coastal traffic is not adequately provided for.

(c) It is desirable that oiling and watering facilities of some kind should in due course be provided at principal minor ports, but this may prove a serious difficulty at some of them and a priority programme of work will need to be drawn up.

(d) Apparently at these minor ports there is no specific charge on cargo, distinct from the charge on ships. This is a little difficult to understand, as port facilities should as far as possible be paid for by the trade using the port, and a very small charge should enable Government to improve the cargo-working facilities on an economic basis.

(e) Tonnage statistics are required for all the ports. It is not possible to make sound and balanced decisions without comparable figures of trade at each and dead-weight tons generally provide the best comparison here as at major ports.

(f) No development of the minor ports for strategical purposes in order to obtain dispersal of port capacity and cargo risks seems possible owing to the small size of the ports.

(g) It should, finally, be realised that the Bombay Government are not anxious to initiate a policy of minor port improvement until the road rail policy of the Government of India is more clearly defined. Para. 63 above deals with this point.

Passengers

68. An outstanding feature of the Bombay minor ports is their passenger traffic, the reason for it being the absence of road and rail facilities in the coastal area. For example, quoting from the Minor Ports Committee, Ratnagiri handled about 133,000 passengers in 1936-37 and Devgad in the same year about 81,000. Last year, 1944-45, the passenger figure on the coast was about two million. In the years before the war over six hundred thousand passengers were transported annually from Bombay itself to the minor ports in and near the Bombay harbour while about a million passengers were carried from Bombay and the minor ports outside the harbour to the minor ports south of Bombay. In addition, about two hundred thousand passengers were carried from Bombay and its minor ports to other ports outside the Province.

These are by no means negligible figures and the Committee was pleased to be given the opportunity of seeing how these passengers are dealt with at some of the ports, including Ratnagiri. The conditions are not ideal. The boats to convey passengers between ship and shore appear well-suited for the purpose, but at some ports and even at Ratnagiri, when occasionally rough weather prohibits the use of the jetty, passengers have to wade through the sea between boat and beach. The half dozen ports that the Committee members visited are well-served by road and road-transport, though lighting at and in the neighbourhood of the port is extremely poor. The accommodation for waiting passengers, except at Ratnagiri, is on the small side and should be enlarged; the same remark applies to the sanitary conveniences. In making these small criticisms we do not, however, forget that in the first place improvement schemes have been held up by the war, and the passenger season does not extend in to the monsoon and therefore normally fine weather is enjoyed by passengers embarking and disembarking. The use of pontoons for landing passengers at small ports has been advocated and seems feasible. They are said to be obtainable

from military disposal sources and are thus described in a note received from the Deputy Superintendent of Light-houses, Bombay :—

“ Built of steel tanks complete with joinery fittings etc. ; the buoyancy tanks are 7/8" thick, 7' long, and 5' square. They are joined together with suitable steel bars and gimbles either side ways or end on. The upper surface of the pontoon where these tanks are joined together gives you a level walking surface and in very hot weather it is possible to fasten a wooden deck as a heat resisting remedy.

These pontoons are fitted at various sections with gimbles enabling the pontoon to slightly bend on a gentle rise of the swell. The fittings of the pontoon are so arranged to enable any formation of the pontoon to meet local conditions ; e.g. a “ T ” end can be made by taking the end section and fastening it across the end of the pontoon, or widening the full pontoon by disconnecting in the middle and fastening the two sections side by side ; in fact, any shape and formation can be made.

The Landing and Wharfage Fees Fund Committee, Bombay, proposes to use these pontoons for landing of passengers at minor ports where landing on the fore-shore is difficult. They will be securely moored in such a way as to enable the passenger tarafas come alongside and step on to the pontoon and walk to the landward and where a ramp is connected to that end of the pontoon. This will enable the passengers and their baggage being landed fairly high up on the beach ”.

Minor Port Policy

69. In conclusion the Committee would emphasize that nothing is to be gained by even considering port development on the West Coast, except for the small improvements desirable in the interests of the passenger traffic, until we see road expansion on the coast. At present the ports south of Bombay are far from the railway and, with their natural disadvantages, are not capable of development because there is no traffic to justify serious expenditure on them. This is not a case in which the port facility will produce the trade ; it is rather one in which road construction may do so and we must wait for that to come first. When Government improve and extend their road communications on the west coast then will be the time to consider development of the small ports dotted along that littoral. This is really the answer to the third term of reference to the Committee so far as the Bombay Province is concerned. Subject to the consideration of passengers vide para. 68 above, no steps are necessary to develop these ports at present except for such small improvements as the Provincial Government may find necessary from time to time and such as the very limited financial capacity of the minor port funds permits. Improvements must follow the trade in this instance and no substantial scheme of small ports development in order to induce new trade need just yet be contemplated

Conservation of the Coastline

70. Reference has been made in paragraph 64 above to Sand Movement. The Bombay minor ports, some of them, suffer severely from silting or erosion. For instance the Committee saw a clear example of the former at Vengurla where the old Customs cargo jetty is no longer accessible to cargo boats except at high tide owing to the silting up of the bay. Of the latter, that is erosion, they saw a striking example at Ratnagiri where rapid incursion of the sea aided by the river is taking place and fallen trees and ruins of walls and buildings litter the fore-shore. No effective steps have been taken to arrest either the one or the other and it is clear from the 1937 report on the minor ports that several other ports are similarly affected by natural changes.

The Committee feels that this is a matter of some importance, greater perhaps than should be left to Provincial Governments who may or may not be fortunate enough to have at their service expert engineering advice and other resources which will enable them to deal correctly with their coastal silting and erosion problems. The matter left in inexperienced hands can easily become disastrous as it bids fair to do at Ratnagiri unless something is done without delay.

It would, therefore, venture to suggest that the transference to the Centre of this subject of coast-protection might well be considered by the Central Government with the Provincial and Maritime States Governments. As a matter of fact the Committee would recommend that the conservation of the coast line of India should be the direct concern of the Central Government.

Madras Minor Ports

71. There are 100 minor ports in the Madras Province, 41 on the west coast and 59 on the east, and these present a very different picture from that of the Bombay ports. In the first place, while Bombay has a comparatively narrow littoral strip between the Western Ghats and the sea, the coastal area on the east coast of India and on that part of the west coast which is in the Madras Province is very much broader, more cultivated and more thickly inhabited. There are not cities on the Bombay coast to compare with Calicut, Tuticorin and Cocanada in Madras and the clear contrast between the minor ports of the two provinces is shown by the following statement of trade of ports in the latter province as compared with that of the former in paragraph 66 above.

MADRAS PROVINCE

Statement showing the trade of the principal Minor Ports—1938-39. (Tuticorin is shown separately as, though a minor port, it is managed by a Port Trust).

Serial No. and Ports	Imports	Exports	Total
	Rs.	Rs.	Rs.
1. Calingapatam	28,224	18,34,078	18,62,302
2. Bimlipatam	5,53,020	37,47,435	43,00,455
3. Cocanada	1,29,97,808	3,32,69,455	4,62,67,263
4. Masulipatam	3,89,514	2,46,78,132	2,50,67,646
5. Cuddalore	37,88,034	1,45,52,076	1,83,40,110
6. Porto Novo	3,28,001	1,69,280	4,97,281
7. Negapatam	51,32,967	1,12,67,467	1,64,00,434
8. Pamban	3,27,801	59,221	3,87,022
9. Calicut	2,68,52,509	3,10,94,377	5,88,46,886
10. Ponnani	21,75,039	7,89,828	29,64,867
11. Badagara	15,50,948	37,02,732	52,53,680
12. Tellicherry	27,80,752	22,43,801	50,24,553
13. Cannanore	60,06,985	15,79,687	75,86,672
14. Mangalore	99,90,983	1,89,61,153	2,89,52,136
15. Malpe	10,60,840	5,35,906	15,96,746
Total	7,39,63,425	14,93,84,628	22,33,48,053
Total of other minor ports	50,21,610	2,38,02,520	2,88,24,130
Grand Total	7,89,85,035	17,31,87,141	25,21,72,182
Tuticorin { (1938-39)	3,12,91,254	4,53,84,993	7,66,76,247
(1944-45)	..	..	9,56,35,706

From the above statement it will be seen that seven of the Madras ports carry in peacetime each an annual trade valued at more than one crore of rupees, and all of the seven cities where these ports are situated are places of fair size, and all owe their importance to their geographical position on the sea-coast and to their sea-trade.

It may be mentioned here that it is a pity that tonnage statistics of cargo at these ports are not readily available, but only value statistics obtained by the Customs Department. The lack of such tonnage statistics is referred to in paragraph 67 above dealing with the Bombay ports; their absence is even more noticeable when we are dealing with the much larger undertakings in the Madras Province. The Committee would, therefore, strongly urge upon the Government of India to take early and effective steps for maintaining full and up-to-date statistics of cargo and passengers passing through all the ports of India.

Madras Government Plans

72. The Committee had a long and full discussion with representatives of the Madras Government on the subject of the future of the Madras ports, their improvement and the financing of works proposed, and it cannot do better than record the various proposals and its opinion on them.

Before taking these, however, it may be mentioned that the first question discussed was whether the Madras Government anticipated any change in the class of ships now carrying the coastal trade of the Presidency through the minor ports. The Presidency Port Officer said that he was under the impression that ships of 500 to 1,000 tons were likely to be put in service for this trade and he said that he had a request from one of the Oil Companies for information whether craft of 10 ft. draft could be taken at the ports of Masulipatam, Cuddalore, Negapatam and Tuticorin. It may be noted that craft drawing 10 feet can lie in the canal at Cocanada where bulk oil is discharged from barges.

The Committee itself has no information that a change in the class of ships performing coastal services is contemplated and it is assumed that the coastal service at least in the near future as in the past, will be maintained by large coasting steamers which lie out in the roadsteads and cannot approach very near the shore and by small sailing craft which can pass over the bars at various ports and do their work at jetties in sheltered water inside. Similarly lighters can also work at these jetties and carry cargo between them and the ships in the roadsteads.

Natural Handicap of the Eastern Ports

73. The littoral sand-drift, which is described in para. 64 above, is the bane of the East coast. It is this which prevents the natural growth of the ports. So long as a port consists of a roadstead with shallow-water jetties inshore as at Cuddalore and Masulipatam, or with open beaches as was in old days the case at Madras, nature does not interfere. As soon, however, as an attempt is made to bring the deep sea close inshore and to confine it between walls the sand makes trouble. It has spread along the south side of Madras Harbour and at one time threatened the entrance; it makes the expense of maintaining useful jetties for deep ships at a very small port prohibitive, and only large trade can justify it. Unless, therefore, there are clear prospects of vastly increased trade at places like Cuddalore and Negapatam such ports must remain as small ports content with the primitive carriage of cargo by lighters between the shore and ships lying at anchor well out to sea. The Committee, however, suggests that suitable steps be taken to maintain the approaches up to a proper standard. Under this category must be included the Port of Chandbali near Cuttack in Orissa. Here the Government propose to spend Rs. 10 lakhs on port improvement but the port will remain a small port and nothing can be done, except at crippling expense, to make it anything more. It is the same natural sand-action that caused the nearby port at False Point to be abandoned, though at one time it appeared to be a natural harbour.

Proposed Dredgers

74. Accepting the possibility that a change in the future size of coasting steamers might materialize the Government of Madras planned to obtain two dredgers at a

cost of roughly Rs. 80 lakhs in order to keep some at least of the ports open for the working of ships of 18 ft. draft or something like it at jetties and quays on the coast-line. There is, however, nothing, as already pointed out, to show that such a change in the type of ship employed is mooted and so this expenditure will be saved but it is quite certain that, if it were found desirable to carry the coasting trade in small coasters drawing about 18 feet, a very heavy dredging commitment would have to be met on the Madras coast.

Overseas Trade of Minor Ports

75. One other peculiarity of some of the Madras eastern ports has to be indicated before we come to the Government's improvement proposals and that is their participation in overseas trade, mainly groundnuts. The ports principally contributing to this trade are Masulipatam and Cuddalore, though others such as Calingapatam, Bimlipatam, Cocanada, Pondicherry and Negapatam also join in it. Broadly speaking the reason for this habit of the groundnut trade is that these ports are nearer to some important producing areas than the larger ports of Madras and Vizagapatam and so rail transport is saved by the use of them. In the two years before the war the following tonnage of groundnuts was handled at the two ports :—

At Masulipatam in 1938-39	162,095 tons.
At Cuddalore 1938-39	122,200 tons.

This may be compared with the Madras tonnage in 1938-39 of 183,850 tons.

Works Proposed

76. The Committee then traversed the Madras Government's proposals for improving their minor ports and discussed these proposals with the Government representatives.

(a) *Cocanada*.—Government have prepared plans for spending about 6½ lakhs at this port, the chief items being the reconstruction of the Dry Dock (120 feet long for dredgers etc.), expected to cost Rs. 1,80,000, the re-alignment of the wharf walls at a cost of Rs. 1,20,000 and thirdly the construction of a masonry retaining wall on the north bank of the Commercial Canal. There are also other proposals of smaller importance. The Committee agrees that the works seem to be sound and should be undertaken.

(b) *Masulipatam*.—The Government have planned to spend Rs. 4,70,000 on improvements to the new bar channel at this port and the work is given priority in the list of works on minor ports. The trouble with the bar channel is that it is now liable to shift as much as 3,000 ft. in some seasons and this makes lighterage work a matter of difficulty. At this port ships lie over five miles off shore, cargo being conveyed to and from them by means of lighters. The wharves are situated at the head of a creek which is very tortuous so that the distance from them to the mouth of the creek is nearly seven miles. Three or four years ago a new bar channel was dredged so as to shorten the distance from the wharves to the mouth but, while this improved condition in the channel, it failed in its prime object owing to the effect of the littoral drift causing the new mouth to travel steadily northwards, now being 2,600 ft. north of where it was out in 1943.

It is now proposed to dredge a deeper and wider channel from the wharves to the mouth, to short-circuit the large bend in the creek by excavation and dredging and to construct groynes seaward from the original site of the new mouth out beyond two fathoms of water so as to stabilize the mouth. From time to time the groynes will have to be extended in order to keep ahead of the accretion which is bound to occur at the Southern groyne. The rapidity of accretion is not known and is a matter of conjecture but, owing to the natural slope of the sea-bed being a very easy one, it is anticipated that accretion will be rapid.

On the whole, judging from past experience of the behaviour of sand on the East coast, the Committee cannot help being a little dubious of the wisdom of this proposal.

an expenditure of Rs. 4,70,000 is not lightly to be undertaken especially as an unknown maintenance obligation is involved and it has been explained to the Committee that the only object of the work is to reduce the length of carriage by lighter.

(c) Minor reconstruction and improvements costing a little over Rs. 2 lakhs are proposed at *Negapattam* and *Cuddalore* and the Committee has no criticism to make on these proposals.

(d) *Calicut*.—Government propose to spend Rs. 9,72,000 on this port. Rs. 1,90,000 is to go to the widening of the South Pier ; Rs. 6,25,000 on the construction of a new pier ; Rs. 75,000 on the construction of a sea face wall north of the North Pier ; Rs. 60,000 on cranes etc. ; and Rs. 22,000 on trolley lines. These proposals seem to the Committee to be sound. Calicut has a large traffic of about 600,000 tons a year but whether this will grow or even continue must depend to some extent on the development of Cochin.

(e) *Mangalore*.—The only substantial work proposed at this port is the reconstruction of the North Wharf at a cost of Rs. 1 lakh and this expenditure is no doubt justifiable. The Committee discussed with Government the question whether the bar at this port should be dredged down to about 14 feet in order to give sufficient depth for the admission of small passenger steamers of 1,500 tons in particular and incidentally cargo ships also. The facilities that will be created by the removal of the bar will be a great relief to the passengers moving to and from Mangalore. It will, however, involve definitely non-remunerative expenditure and will call for maintenance dredging operations. It is difficult to say whether the incurring of such expenditure will be justified by the nature and the extent of the relief that it will provide for. Such work could similarly be undertaken at the ports of Beypore (Calicut) and Cuddalore but, apart from the works themselves, maintenance dredging will be required.

(f) *Tuticorin*.—The Port Trust Board which manages the affairs of Tuticorin port has a programme of works amounting to over Rs. 12½ lakhs. Of this amount, however, Rs. 9 lakhs are allocated to a new Dry Dock and accompanying buildings and the Committee is informed that it has been decided to postpone this work. The balance of over Rs. 3½ lakhs is spread over several items of wharves, jetties and passenger facilities, also a new grab dredger and several other smaller items. All these works represent normal port improvement.

(g) Other much smaller works are proposed at the minor ports of Adirampattam, Tellicherry, Malpe, Coondapore, Hengarkotta and Calingapatam, and the Committee has no special remarks to make on them.

Less Urgent Works

77. A programme of improvement of very small minor ports has also been prepared by Government, the works consisting mainly of piers at each port. In conversation, however, with the Government representatives it did not appear to the Committee that very great significance is attached to these proposals and no necessity has been established for them.

Financing of the Works

78. The Madras Government representatives were asked how it is proposed to finance the works detailed in paragraph 76 above and it was explained to the Committee that the present proposal of Government is to make a free grant of Rs. 43 lakhs to cover them. It appears that funds to this amount lay some years ago in the Minor Ports Fund and that about the year 1939 Government used those moneys for other purposes. Now it is suggested that the money may be re-transferred to the Minor Ports Fund and be used to carry out the improvements to minor ports mentioned above. Financing of the works may safely be left to Government and the Committee have no comments to make except that, while the expenditure under paragraph 76

above seems on the whole to be justified, there does not appear any very strong reason why the improvements referred to in paragraph 77 costing nearly Rs. 59 lakhs should be undertaken at this stage. Consideration can always be given in later years in the light of industrial and/or agricultural developments of the hinterland to these widely dispersed Ports.

The Madras Government have now proposed to start the programme of works with a 5-year plan including the following items :—

Minor Ports	Rs. 1.25 lakhs in 1945-46.
	Rs. 15.59 lakhs in 1946-47.
Port of Tuticorin	Rs. 4 lakhs in 1946-47.
Marine fisheries	Rs. 1.7 lakhs in 1946-47.
Transport of fish.	Rs. 5.18 lakhs in 1946-47.

Calicut and Tuticorin

79. In paragraph 25 above attention has been drawn to the somewhat artificial distinction between major and minor ports. Calicut and Tuticorin emphasize the weakness of this distinction because Tuticorin has reached a tonnage of about 500,000 tons a year and Calicut of 600,000, figures comparable with those of Vizagapatam and Chittagong and almost as large as the tonnage of Cochin. The traffic at Tuticorin consists chiefly of imports of grain, coal, cotton, cocoanuts and exports of grain, fibre, vegetables, cotton yarn, dry fish and salt and that at Calicut of imports of grain and manure and exports of tea, groundnuts, coir and coffee.

These two ports serve a large hinterland and do considerable trade and it is not perhaps a wise policy to separate them from the major ports as though they were in some way different in quality. The Committee, therefore, feels that the potentialities of these ports becoming major ports in course of time should influence the solution of the problems connected therewith.

Other Port Projects

80. Various other proposals for ports have been made during recent months. A private request has been received for consideration of development of the port of Vembar in the Gulf of Manaar and a somewhat similar request for port construction near Point Calimere. These two proposals are, however, somewhat nebulous and require first of all examination by the Government controlling the minor ports.

Conclusion of the Report

81. The Committee, in concluding its report, offers its grateful thanks to those Government officers and others who have supplied the information requisite to meet the terms of reference and have also tendered their advice on various points. This is not a report on the whole port policy of Government and most of the major ports are barely mentioned but the terms of reference have demanded a fairly extensive review of the future of Indian ports, involving consideration of many aspects of transport in which the Committee has been much assisted by outside views. As a matter of fact, the Committee has stated at the very outset of the Report the broad considerations of a port policy which have influenced their views.

Finally ports are vital links in the effective and efficient working of transport both by sea and land. And, while the establishment and expansion of ports will have to be related to the general development of trade and transport in the country, the Committee is convinced that the planning of ports and their construction and the services which they have to provide should, in the national economy of the country, precede the anticipated developments and needs of transport.

Recommendations of the Committee

82. The Committee is strongly of the opinion that the following broad considerations, namely—

- (a) the economic indivisibility of British India and Indian States ;

- (b) the increasing requirements of India's rapidly expanding agriculture and industries, as also the desirability of the dispersal of industries ;
- (c) the integration and implementation of a comprehensive, well-balanced and efficient policy of transport and its effective development in all its forms ;
- (d) the routing of trade through ports not to be influenced by Customs Policy ;
- (e) the need for a long view in the siting of new ports and the development of existing ones ;
- (f) the evolution of a sound policy of Defence for the whole country ;
- (g) the geographical position and importance of India in the Indian Ocean ;
and
- (h) the strategic importance of India in the development of a World Order in the Far East,

should govern the formulation of an all-embracing and progressive port policy for India.

(2) As regards the first term of reference, the Committee is of the opinion that Vizagapatam on the East Coast should be developed as a sheltered deep sea port which can accommodate ships at least up to 650 feet in length with drafts up to 30 feet.

For this purpose the Committee strongly recommends that the improvement at the entrance, the expansion of the quays, the building of a dry dock and the provision of other facilities mentioned in the Report should be immediately taken in hand and the finance required for the execution of the whole project should be found by the Government of India.

The Committee suggests that, with the further development of the Vizagapatam harbour and the railway system leading thereto, a proper future lay-out of the city of Vizagapatam with Waltair is called for.

(3) The recommendation of the Committee for the development of Vizagapatam has not made it necessary for it to examine the possibility of the establishment of another sheltered deep sea port between Vizagapatam and Calcutta, but the Committee feels that the Government may need to investigate such a possibility in due course.

(4) As regards the proposals for a Ship Canal scheme and River Training Works, as suggested by the Chairman of the Calcutta Port Commissioners, the Committee feels that it cannot, on the data available before it, say that those proposals are financially sound or will effectively attain the object which they have in view. The Committee would, however, welcome the fullest and the earliest investigation of the improvements to the navigable approaches to the Port of Calcutta and the drawing up of a scheme for that purpose which would, without permanently affecting deep sea navigation in the Upper and Lower Reaches of the Hooghly, provide facilities for steamers with deeper drafts to navigate to and from Calcutta at all times. The Committee, therefore, suggests that the technical, financial and other relevant aspects of this or any other scheme, with particular reference to its permanent repercussions on the Upper and Lower Reaches of the Hooghly, should be fully examined by experts. And in connection with the proposed extensions of King George's Dock the effect of the policy of dispersal of industries on the volume of traffic that will flow through the port in future should be fully gone into.

(5) As regards Madras, the Committee recommends that the vesting in the Madras Port Trust of the prescriptive rights over the land south of the harbour should be arranged, so that the harbour water-front can be enlarged in the only possible direction as and when the trade of the port may demand it. The Committee further recommends that the Board may actively pursue the experiments which it has been carrying on at present for the reduction of the range. Whether these experiments are successful or not, the Committee recommends that the first stage of the Wet Dock Scheme for four berths should be completed within a period of ten years.

(6) As regards the second term of reference, the Committee is of the opinion that here is a need for a major port between Karachi and Bombay in the Gulf of Cutch

and feels that, on the information at its disposal with particular reference to surveys made and schemes in prospect, Sika is the most promising site for the purpose ; and recommends that the necessary steps for the execution of such a scheme at Sika be taken. The Committee further suggests that with a view to providing effective and quick rail transport without transshipment to areas in Central and Upper India, on which traffic the port would need to depend largely for its economic prosperity, the laying of a broad gauge rail line from Sika to Viramgam or any other suitable station should form a part of the scheme.

(7) For the successful working of the Kathiawar ports and for the effective execution of the Sika scheme, the Committee considers the evolution of a common and unified policy for the working of the Kathiawar ports and Kathiawar railways is essential and recommends that negotiations for that purpose may be carried on by the Government of India with the Indian States in Kathiawar.

(8) The Committee is of opinion that the development of Bhatkal as a major port is essential for providing a good economic outlet for the trade of the large and rich hinterland of the Mysore State lying behind it. From the data of the existing and potential traffic and Engineer's report relating to the scheme placed before it, the Committee considers it both a practical and good financial proposition. In view, however, of the fact that the engineering report and part of the traffic estimate were made a generation ago, the Committee is of the opinion that a fresh report regarding engineering possibility of the scheme and fresh data of traffic should be called for.

(9) As regards the Vizhinjam proposals of the Travancore State, the Committee is of opinion that the scheme should be carefully examined after the State has submitted a satisfactory engineering report in connection therewith.

(10) As regards the Rameswaram canal project, the Committee considers it as unlikely to prove a practical success from the commercial point of view.

(11) As regards the proposal for developing the Cocanada Harbour into a major port, the Committee does not consider it likely to be essential in the interest of future trade or necessary for the purpose of defence and strategy. It is, however, of the opinion that the Madras Government's request for an engineering survey of the Cocanada proposal may be complied with and the report in connection with the scheme may be invited.

(12) As regards the third term of reference, the Committee recommends that the relative economics of transport by sea and transport by rail should be fully investigated by the Government of India and that the policy which the Government propose to adopt for the maintenance and expansion of the comparatively cheaper form of transport should be enunciated in clear and precise terms.

(13) In the meantime, the Committee recommends that the schemes for improvement of the minor ports framed by the Provincial Governments, subject to the Committee's criticisms in certain cases, should be carried out.

(14) The Committee further recommends that the conservation of the coastline of India should be the direct concern of the Central Government.

G. G. ARMSTRONG.
M. H. GAZDAR.
M. A. MASTER.
D. P. KHAITAN.
L. W. BALCOMBE.
J. R. GALLOWAY.
A. WEBSTER.

7th May 1946.